Government
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SESSIONAL PAPERS.

VOL. XXXIV.—PART V.

FIFTH SESSION, NINTH LEGISLATURE

OF THE

PROVINCE OF ONTARIO

SESSION 1902.

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LIST OF SESSIONAL PAPERS.

ARRANGED ALPHABETICALLY.

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Accounts, Public, 1901	1	*Printed.*
Agricultural College, Report	14	"
Agricultural and Experimental Union, Report	15	"
Assessment Commission, Report	48	"
Asylums, Report	38	"
" amount received for support of patients	55	*Not printed.*
Bee-Keepers Association, Report	20	*Printed.*
Birds of Ontario, in relation to Agriculture	56	*Printed (for distribution only)*
Births, Marriages and Deaths, Report	9	*Printed.*
Blanche River Pulp Co'y. Agreement	68	"
Blind Institute, Report	41	"
Children's Protection Act, Report	43	*Printed.*
" " Visiting Committees	70	*Not printed.*
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Colonization, Report	32	*Printed.*
Crown Lands, Report	3	"
Dairymen's Associations, Report	22	*Printed.*
Deaf and Dumb Institute, Report	42	"
Division Courts, Report	33	"
Doyle, Judge, Surrogate fees	52	*Not printed.*
Education, Report	12	*Printed.*
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Entomological Society, Report	19	"
Estimates, 1902	2	"
Factories, Report	8	*Printed.*
Fairs and Exhibitions, Report	26	"
Farmers Institutes, Report	25	"
Fisheries, Report	31	"
" appointees, Rideau waters	60	*Not printed.*
Forestry, Report	4	*Printed.*
Fruit Experiment Stations, Report	17	"
Fruit Growers Association, Report	16	"
Fumigation Appliances, Report	18	"
Game Commission, Report	30	*Printed.*
Gaols, Prisons, etc., Report	39	"
" persons confined in	59	*Not printed.*

TITLE.	No.	REMARKS.
Gas Export—Essex	66	*Not printed.*
Grand River, damage by ice, etc	69	"
Guardian *ad litem*, account of	50	"
Health, Board of, Report	36	*Printed.*
Highways Commissioner, Report	27	"
Hospitals, Report	40	"
Imperial Statutes, compilation	49	*Printed.*
Industries, Report	28	"
Insurance, Report	10	"
Jennings, W. J., Report *re* Grand River floods	69	*Not printed.*
Judicature Act, O. in C., commutation	52, 76 51	"
Klein, Judge, O. in C., commutation	76	*Not printed.*
Labour, Report	29	*Printed.*
Legal Offices, Report	34	"
Library, L. A., Report	47	*Not printed.*
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Live Stock Associations, Report	23	"
" Registrar of, Report	24	"
Loan Corporations, Report	11	"
McKinnon, A. M., commutation	51	*Not printed.*
McNab Lumbering Co'y., correspondence	65	"
Mad and Nottawasaga Rivers, overflow	75	"
Mines, Report	5	*Printed.*
Montreal River Pulp Co'y., agreement	71	"
Municipal Auditor, Provincial, Report	45	"
Nepigon Pulp Co'y., agreement	64	*Printed.*
Poultry Associations, Report	21	*Printed.*
Prisons and Reformatories, Report	39	"
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Public Accounts, 1901	1	"
Public Works, Report	7	"
Queen Victoria Niagara Falls Park, Report	6	*Printed.*
Railways, bonuses and subsidies voted	58	*Not printed.*
Registrar General, Report	9	*Printed.*
Registry Offices, Inspectors report	35	"
Roadmaking, Report	27	"
San José Scale, Report	54	*Printed.*
San José Scale, trees infested with, and destroyed	57	*Not printed.*

Title.	No.	Remarks.
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Smallpox outbreak	53	*Not printed.*
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" distribution of	72	*Not printed.*
Sturgeon Falls Pulp Co'y., agreement	67	*Printed.*
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Temiskaming Railway, survey of route	74	*Not printed.*
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No. 2.. Estimates (*Vote of Credit*) for the year 1902. Presented to the Legislature, 16th January, 1902. *Not Printed.* Estimates for the year 1902. Presented to the Legislature, 20th January, 1902. *Printed.* Estimates (Supplementary.) Presented to the Legislature, 6th March, 1902. *Printed.* Estimates (Further Supplementary.) Presented to the Legislature, 13th March, 1902. *Printed.*

No. 3.. Report of the Commissioner of Crown Lands, for the year 1901. Presented to the Legislature, 17th February, 1902. *Printed.*

No. 4.. Report of the Clerk of Forestry for the years 1900-1901. Presented to the Legislature, 6th February, 1902. *Printed.*

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No. 5.. Report of the Bureau of Mines, for the year 1901. Presented to the Legislature, 4th March, 1902. *Printed.*

No. 6.. Report of the Commissioners for the Queen Victoria Niagara Falls Park, for the year 1901. Presented to the Legislature, 28th January, 1902. *Printed.*

No. 7.. Report of the Commissioner of Public Works for the year 1901 Presented to the Legislature, 11th February, 1902. *Printed.*

No. 8.. Report of the Inspectors of Factories, for the year 1901. Presented to the Legislature, 4th March, 1902. *Printed.*

No. 9.. Report upon the Registration of Births, Marriages and Deaths in the Province for the year 1901. Presented to the Legislature, 21st February, 1902. *Printed.*

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No. 10.. Report of the Inspector of Insurance and Registrar of Friendly Societies for the year 1902. Presented to the Legislature, 5th March, 1902. *Printed.*

No. 11.. Financial Statements made by Building Societies, Loan Companies, Loaning Land Companies and Trust Companies for the year 1901. Presented to the Legislature, 5th March. 1902. *Printed.*

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No. 12.. Report of the Minister of Education—Parts I and II—for the year 1901, with the Statistics for the year 1900. Presented to the Legislature, 13th January, 1902. *Printed.*

No. 13.. Report of the University of Toronto, Auditors Report on Capital and Income Accounts for the year ending 30th June, 1901. Presented to the Legislature, 9th January, 1902. *Printed.*

No. 14.. Report of the Ontario Agricultural College and Experimental Farm, for the year 1901. Presented to the Legislature, 18th February, 1902. *Printed.*

No. 15. Report of the Agricultural and Experimental Union of Ontario, for the year 1901. Presented to the Legislature, 4th March 1902. *Printed.*

No. 16.. Report of the Fruit Growers Association for the year 1901. Presented to the Legislature, 4th March 1902. *Printed.*

No 17.. Report of the Fruit Experiment Stations of Ontario, for the year 1901. Presented to the Legislature, 11th February, 1902. *Printed.*

No. 18.. Report of the Inspector of Fumigation Appliances in Ontario, for the year 1901. Presented to the Legislature, 14th February, 1902 *Printed.*

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No. 19.. Report of the Entomological Society for the year 1901. Presented to the Legislature, 4th March, 1902. *Printed.*

No. 20.. Report of the Bee-Keepers Association for the year 1901. Presented to the Legislature, 5th March, 1902. *Printed.*

No. 21.. Report of the Poultry Association for the year 1901. Presented to the Legislature, 27th February, 1902. *Printed.*

No. 22 . Report of the Dairymen's Association for the year 1901. Presented to the Legislature, 4th March, 1902. *Printed.*

No. 23.. Report of the Live Stock Breeders' Association for the year 1901. Presented to the Legislature, 22nd February, 1902. *Printed.*

No. 24.. Report of the Registrar of Live Stock for the year 1901. Presented to the Legislature, 4th March, 1902. *Printed.*

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No. 25.. Report of the Farmers' Institutes of the Province for the year 1901. Presented to the Legislature, 13th January, 1902. *Printed.*

No. 26.. Report of the Canadian Association of Fairs and Exhibitions for the year 1901. Presented to the Legislature, 13th January, 1902. *Printed.*

No 27.. Report of the Commissioner of Highways for the year 1901. Presented to the Legislature, 6th March, 1902. *Printed.*

No. 28.. Report of the Bureau of Industries for the year 1901. Presented to the Legislature, 4th March, 1902. *Printed.*

No. 29.. Report of the Bureau of Labour for the year 1901. Presented to the Legislature, 27th February, 1902. *Printed.*

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No. 31.. Report of the Department of Fisheries for the year 1901, Presented to the Legislature, 28th February, 1902. *Printed.*

No. 32.. Report of the Director of Colonization for the year 1901. Presented to the Legislature, 4th March, 1902. *Printed.*

No. 33.. Report of the Inspector of Division Courts for the year 1901. Presented to the Legislature, 29th January, 1902. *Printed.*

No. 34.. Report of the Inspector of Legal Offices for the year 1901. Presented to the Legislature, 20th January, 1902. *Printed.*

No. 35.. Report of the Inspector of Registry Offices for the year 1901. Presented to the Legislature, 14th February, 1902. *Printed.*

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No. 36.. Report of the Board of Health for the year 1901. Presented to the Legislature, 4th March, 1902. *Printed.*

No. 37.. Report of the Secretary and Registrar of the Province for the year 1901. Presented to the Legislature, 9th January, 1902. *Printed.*

No. 38.. Report upon the Lunatic and Idiot Asylums of the Province for the year ending 30th September, 1901. Presented to the Legislature, 14th February, 1902. *Printed.*

No. 39.. Report upon the Common Gaols, Prisons and Reformatories of the Province for the year ending 30th September, 1901. Presented to the Legislature, 14th February, 1902. *Printed.*

No. 40.. Report upon the Hospitals, Refuges, etc, of the Province for the year ending 30th September, 1901. Presented to the Legislature, 5th March, 1902. *Printed.*

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No. 41.. Report upon the Ontario Institution for the Education of the Blind, Brantford, for the year ending 30th September, 1901. Presented to the Legislature, 13th January, 1902. *Printed.*

No. 42.. Report upon the Ontario Institution for the Education of the Deaf and Dumb, Belleville, for the year ending 30th September, 1901. Presented to the Legislature, 13th January, 1902. *Printed.*

No. 43.. Report upon the work under the Children's Protection Act for the year 1901. Presented to the Legislature, 27th February, 1902. *Printed.*

No. 44.. Report of the Inspector of Liquor Licenses for the year 1901. Presented to the Legislature, 9th January, 1902. *Printed.*

No. 45.. Report of the Provincial Municipal Auditor for the year 1901. Presented to the Legislature, 9th January, 1902. *Printed.*

No. 46. Return from the Records of the several elections to the Legislative Assembly in the Electoral Districts of South Perth, North Waterloo, London, East Kent and West Huron, since the General Election of March 1st, 1898, shewing:—(1) The number of Votes polled for each Candidate in the Electoral District in which there was a contest. (2) The majority whereby each successful Candidate was returned. (3) The total number of Votes polled in each District. (4) The number of names on the Voters' Lists in each District. (5) The population of each District as shewn by the last Census. Presented to the Legislature, 9th January, 1902. *Printed.*

No. 47.. Report of the Legislative Librarian on the State of the Library. Presented to the Legislature, 8th January, 1902. *Not Printed.*

No. 48.. Report of the Assessment Commission 1902. Presented to the Legislature, 19th February, 1902. *Printed.*

No. 49.. Copy of Order in Council and Report of Committee *re* Compilation of the Imperial Statutes in force in the Province, under the provisions of Chapter 111, R.S.O., 1897, and now contained in Vol. III. R.S.O. Presented to the Legislature, 9th January, 1902. *Printed for Sessional Papers only.*

No. 50.. Account of the Official Guardian *ad litem* for the year 1901. Presented to the Legislature, 13th January, 1902. *Not Printed.*

No. 51.. Copy of Order in Council respecting the commutation of fees of A. M. McKinnon, Local Master and Registrar at Guelph. Presented to the Legislature, 15th January, 1902. *Not Printed.*

No. 52.. Copy of Order in Council respecting payment to His Honour B. L. Doyle, Junior Judge of the County of Huron, of the surplus Surrogate fees of the County. Presented to the Legislature, 15th January, 1902. *Not Printed.*

No. 53.. Return to an Order of the House, for a Return shewing:—(1) In what municipalities and unorganized districts has smallpox appeared in Ontario since January 1st, 1900. (2) What has been the source of the outbreak in each case. (3) What action was taken by the Government of the Province in the different outbreaks to prevent the spread of the disease. (4) To what extent was vaccination employed in the different outbreaks to limit the spread of the disease. (5) In how many places do Isolation Hospitals exist. (6) And whether (a) temporary or (b) permanent. (7) In how many centres in (a) organized districts, and (b) unorganized. Presented to the Legislature, 15th January, 1902. Mr. *Smith. Not Printed.*

No. 54. Report of Inspector of San José Scale for the year 1901. Presented to the Legislature, 25th February, 1902. *Printed.*

No. 55. Return to an Order of the House for a Return, shewing what amount, if any, has been received from private parties towards the support of their relatives or otherwise, in the respective Insane Asylums of the Province during the year 1901. Presented to the Legislature 24th January, 1902. Mr. *Hoyle.* *Not Printed.*

No. 56. The Birds of Ontario in relation to Agriculture. Presented to the Legislature, 29th January, 1902. *Printed for distribution only.*

No. 57. Return to an Order of the House for a Return, shewing the number of fruit trees infested by the San José Scale, condemned to be destroyed by the Inspector or Inspectors in the County of Lincoln, the number actually destroyed: the number condemned but not destroyed; the names and residence of the owners of those not destroyed and the reason why not destroyed. Presented to the Legislature, 30th January, 1902. Mr. *Jessop.* *Not Printed.*

No. 58. Return to an Order of the House for a Return, shewing:—(1) The amount of bonuses or subsidies voted to Railways by this Legislature, each year during 1898, 1899, 1900 and 1901. (2) The names of each railway receiving the same and the amount voted to each during that time. (3) The amount paid to each railway during each of such years, and the condition or conditions upon which such payments were made. Presented to the Legislature, 6th February, 1902. Mr. *Joynt.* *Not Printed.*

No. 59. Also—Return to an Order of the House for a Return, shewing the number of persons confined in the different Gaols of the Province on January 14th, 1902, as indigent persons unable to support themselves, and the length of time each person had been confined. Also, shewing the number of insane persons confined in the different Gaols of the Province on January 14th, 1902; the length of time so confined, and the reason therefor. Presented to the Legislature, 6th February, 1902. Mr. *Barr.* *Not Printed.*

No. 60. Return to an Order of the House for a Return, shewing:—(1) Who are the appointees under the Fisheries Department over the Rideau waters. (2) The name and the amount of salary of each overseer and sub overseer between Kingston and Ottawa. (3) The local jurisdiction of each overseer and sub-overseer, separately, as to limit of waters. (4) The number of licenses which have been granted during 1900 and 1901. (5) The name of each licensee and the amount paid for license individually. (6) The other sources of revenue under the Fisheries Department from fishing and otherwise for Ontario, from the Rideau waters. (7) The total revenue and expenditure in connection with the said waters under the Department. Presented to the Legislature, 7th February, 1902. Mr. *Joynt.* *Not Printed.*

No. 61. Return to an Order of the House for a Return, giving the name of each License Commissioner in each License District in the Province and the amount of expenses allowed in each District, up to the 30th

April, 1901. The name and salary of each License Inspector in the Province up to the 30th April, 1901, the county for which he was appointed and the amount allowed each Inspector for expenses. Presented to the Legislature, 10th February, 1902 Mr. *Burr*. *Not Printed.*

No. 62.. Report in the matter of the Scott Enquiry *re* timber. Presented to the Legislature, 13th February, 1902. *Not Printed.*

No. 63.. Report on Sugar Beet Experiments in Ontario. Presented to the Legislature, 4th March, 1902. *Printed.*

No 64.. Agreement between His Majesty, represented by the Commissioner of Crown Lands, of the one part, and the Nepigon Pulp, Paper and Manufacturing Company, Limited, of the other part. Presented to the Legislature, 4th March, 1902. *Printed.*

No. 65.. Return to an Address to His Honour the Lieutenant-Governor, praying that he will cause to be laid before this House, a Return of copies of all Orders-in-council, correspondence and telegrams between the Government, or any official thereof, and the McNab Lumbering Company, Peter Ryan, John Bell, John Drynan, and any other person or persons, interested in the company, relating to certain lumber stored at Ingoldsby Station, and the timber dues thereon. Presented to the Legislature, 18th February, 1902. Mr. *Fox*. *Not Printed.*

No. 66.. Return to an Order of the House for a Return, of copies of all correspondence since January 1, 1901, between the Attorney-General, or any officer of his Department, and any other person or persons, relating to the export of gas from the Province under any lease; also, copy of such lease; also, copy of any instructions to, and any report made by Mr. Stiff on the subject since said date: also, copy of any injunction served on the Sheriff of the County of Essex forbidding him to interfere with the pipes of any Gas Company. Presented to the Legislature, 18th February, 1902. Mr. *Whitney*. *Not Printed.*

No. 67.. Agreement between His Majesty, represented by the Commissioner of Crown Lands, of the one part, and the Sturgeon Falls Pulp Company, Limited, of the other part. Presented to the Legislature, 4th March, 1902. *Printed.*

No. 68.. Agreement between His Majesty, represented by the Commissioner of Crown Lands, of the one part, and the Blanche River Pulp and Paper Company, Limited, of the other part. Presented to the Legislature, 4th March, 1902. *Printed.*

No. 69.. Report of W. T. Jennings, Esquire, M.S.C.E., upon the cause of damage by high water and ice in the Grand River at Galt, Ontario. Presented to the Legislature, 25th February, 1902. *Not Printed.*

No. 70.. Return to an Order of the House for a Return, shewing the number of Visiting Committees appointed under the provisions of the Act respecting Neglected and Dependent Children. Presented to the Legislature, 27th February, 1902. Mr. *Smith*. *Not Printed.*

No. 71.. Agreement between His Majesty, represented by the Commissioner of Crown Lands, of the one part, and the Montreal River Pulp and Paper Company, of the other part. Presented to the Legislature, 5th March, 1902. *Printed.*

No. 72.. Statement of distribution of Revised and Sessional Statutes, up to 31st December, 1901. Presented to the Legislature, 4th March, 1902. *Not Printed.*

No. 73.. Return to an Order of the House, for a Return, shewing what number of Cold Storage Associations have been incorporated: where they are, and what amount was paid by the Province to each of the Associations formed under the Act of 1900, to provide for the incorporation of Co-operative Cold Storage Associations. Presented to the Legislature, 5th March, 1902. Mr. *McLaughlin. Not Printed.*

No. 74.. Return to an Order of the House for a Return, a copy of any Report, or other document, made to any Department of the Government by the engineer, or other officer or person, who surveyed the route of the proposed Temiskaming Railway. Presented to the Legislature, 7th March, 1902. Mr. *Beatty (Leeds.) Not Printed.*

No. 75.. Return to an Order of the House for a Return, of copies of all correspondence between any person or persons resident in the Townships of Sunnidale, Flos or Vespra, and the Government or any member or official thereof, relating to the drowning of lands therein caused by the overflow of the Mad and Nottawasaga Rivers, together with a copy of the Report of the Engineers upon the cause of such overflow or floods. Presented to the Legislature, 10th March, 1902. Mr. *Thompson. Not Printed.*

No. 76.. Copy of an Order-in-Council commuting the fees of His Honour A. B. Klein, Junior Judge of the County Court of Bruce Presented to the Legislature, 15th March, 1902. *Not Printed.*

THIRTY-SECOND ANNUAL REPORT

OF THE

ENTOMOLOGICAL SOCIETY

OF

ONTARIO

1901.

PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

PRINTED BY ORDER OF
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THIRTY-SECOND ANNUAL REPORT

OF THE

ENTOMOLOGICAL SOCIETY OF ONTARIO,

1901.

To the Honorable John Dryden, Minister of Agriculture:

Sir,—I have the honor to present herewith the Thirty-Second Annual Report of the Entomological Society of Ontario.

The thirty-eighth annual meeting of the Society was held in London on the 13th and 14th of November, 1901, at which the members had the gratification of your presence and participation in the proceedings. During the sessions the officers for the ensuing year were elected; reports were presented by the various branches, sections and officers of the Society, including the audited financial statement of the Treasurer; and papers and addresses were given on a variety of entomological subjects, many of which are of great practical value.

The Society's monthly magazine, the *Canadian Entomologist*, has been regularly issued during the year and has now completed its thirty-third volume. Its circulation in all parts of the world continues to increase and its high scientific character has been ably maintained by a large number of contributors.

I have the honor to be, Sir,

Your obedient Servant,

Charles J. S. Bethune,
Editor.

London, Ontario.

OFFICERS FOR 1901-1902.

President .....Rev. T. W. Fyles, D.C.L., F.L.S., South Quebec.

Vice-President.....Professor William Lochhead, Ontario Agricultural College, Guelph.

Secretary..... .....William E. Saunders, London.

Treasurer .....J. H. Bowman, London.

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Division No. 2—J. D. Evans, Trenton.
Division No. 3—E. M. Walker, Toronto.
Division No. 4—G. E. Fisher, Freeman.
Division No. 5—J. A. Balkwill, London.

Directors Ex-officio....(Ex-Presidents of the Society)—Professor Wm. Saunders, LL D., F.R.S.C., F.L S., Director of the Experimental Farms, Ottawa ; Rev. C. J. S. Bethune, M.A., D.C.L., F.R.S C., London ; James Fletcher, LL.D., F.R.S.C., F.L.S , Entomologist and Botanist, Experimental Farms, Ottawa ; W. H. Harrington, F.R.S.C., Ottawa ; John Dearness, Normal School, London ; Henry H. Lyman, M.A., F.R.G.S., F.E.S., Montreal.

Director Ex-officio—(Ontario Agricultural College)—Professor Wm. Lochhead, Guelph.

Librarian and Curator—J. Alston Moffat, London.

Auditors—J. A. Balkwill and W. H. Hamilton, London.

Editor of the Canadian Entomologist—Rev. Dr. Bethune, London.

Editing Committee—Dr. J. Fletcher, Ottawa ; H. H. Lyman, Montreal ; J. D. Evans, Trenton ; W. H. Harrington, Ottawa ; Professor Lochhead, Guelph.

Delegate to the Royal Society—Rev. Dr. Bethune, London.

Delegates to the Western Fair—J. A. Balkwill, and W. E. Saunders, London.

Committee on Field Days—The Chairmen of the Sections and Dr. Woolverton, Messrs. Balkwill, Bowman, Law, Moffat, Rennie and Saunders, London.

Library and Rooms Committee—Messrs. Balkwill, Bethune, Bowman, Dearness, Moffat and Saunders, London.

THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

ANNUAL MEETING.

The thirty-eighth annual meeting of the Entomological Society of Ontario was held in London on Wednesday and Thursday, the 13th and 14th of November, 1901. The chair was occupied by the Rev. Dr. Fyles, of South Quebec, President. Among the members present were Dr. James Fletcher and Mr. Arthur Gibson, Central Experimental Farm, Ottawa ; Mr. Henry H. Lyman, Montreal ; Mr. John D. Evans, Trenton ; Prof. Lochhead, Ontario Agricultural College, Guelph ; Mr. Geo. E. Fisher, Inspector of Scale Insects, Freeman, Ont. ; Mr. Charles H. Young, Hurdman's Bridge, Ont. ; Prof. F. M. Webster, State Entomologist, Wooster, Ohio ; Revs. Canon Dann and Dr Bethune ; Drs. W. J. and H. A. Stevenson, Dr. Woolverton, Messrs. J. A. Balkwill, J. H. Bowman, J. Dearness, John Law, J. Alston Moffat, W. E. Saunders, R W. Rennie, E. A. Brown, Demster, Thompson, Lochhead, and many other residents of London. The Society was also favored with the presence of the Hon. J. Dryden, Minister of Agriculture for Ontario, and Mr. G. C. Creelman Superintendent of the Farmers' Institutes of Ontario.

Letters expressing regret at their inability to attend were received from Directors, W. H. Harrington, Ottawa ; D. G. Cox, Toronto ; and James Johnston, Bartonville ; and from Messrs. E. M. Walker, Toronto ; A. F. Winn and Dwight Brainerd, Montreal.

The morning of Wednesday, November 13th, was taken up with a meeting of the Council for the transaction of the business of the Society and the preparation of their annual report. In the afternoon the Society met at 2.30 o'clock and at once proceeded to discuss the progress, present aspect and future outlook of the San José scale in Ontario The President, Dr. Fyles, expressed his gratification at the presence of so many eminent men at their meeting and felt assured that the conference they were entering upon would be of great value both to themselves and to all interested in fruit culture in this Province.

SAN JOSÉ SCALE DISCUSSION.

At the request of the President, Mr. George E. Fisher, of Freeman, Ont., the Provincial Inspector of Scale insects, opened the discussion. The following is a condensed summary of his address : I wish to state at the outset and to emphasize very strongly the fact that very few fresh localities have been found this year infested by the San José scale. This is very encouraging and leads us to feel that the prospects of stamping it out are not altogether hopeless. People are now realizing better than ever before how dangerous an enemy it is ; but it is remarkable how many mistakes were made in identifying the scale, the oyster-shell bark-louse, the scurfy bark-louse, and others, being mistaken for it. In the localities where the scale is present, its increase and destructiveness have been greater than ever before ; it does not confine itself to one place, but reaches out into new localities beyond its former limits. As an illustration of the very great increase of the scale, I may give one instance. There is an orchard of 1,600 peach trees which was inspected in August, 1899, by seven experienced men ; they spent six days in their examination and only found the scale on 87 trees, showing that the infestation was but slight. In August of the following year, 1900, I could find the scale on every tree I looked at, but still a good crop of fruit was produced. This year (1901) that orchard is practically dead ; it will never bear another crop of fruit ; the scale is to be seen

everywhere throughout it. There are quite a number of just such orchards as that, and they constitute an object lesson which is constantly before the people—they cannot close their eyes to a dead orchard. In another orchard I have eaten peaches this last summer gathered from trees which have since become encrusted with the scale and will soon die from the attack.

There is a third orchard that I know of, a large orchard, from which about 25,000 baskets of peaches were picked this year. About the 25th of September I visited it and found the scale on every tree along a row reaching across the orchard; unless this orchard is put under proper treatment at once it has only one more year to live The alarming rapidity with which the scale spreads when once it has found lodgment causes it to be so destructive and so difficult to control. Thus far I have spoken of peach trees, but the scale attacks other kinds also. We have instances of plum trees, pear trees and even apple trees which are dead from the attack of the scale. Apple trees I have found more resistant than peach and was inclined at first to think that they would not be much affected, but the evidence to the contrary is too conclusive when we find apple trees which have been killed outright by the scale. The lower limbs are usually attacked first and then it spreads upwards till the whole tree is infested. I visited an apple orchard of 350 trees in 1899 which was then bearing well; the scale was found but the infestation was slight. Last year it bore a good crop of fruit, but it is doomed and will never bear again—most of the trees will be dead next year.

Now, as to remedies. There are four which serve good purposes. These are whale-oil soap; crude petroleum, and a combination of these two; lime, salt and sulphur (the favorite wash in California); and fumigation with hydro-cyanic acid gas. Whale-oil soap should be made strong, 2½ lbs. of good soap to a gallon of hot water, and should be applied freely to saturate every part of the tree. Many people sprayed only one side of their trees, waiting for the wind to change to do the other, and ending by leaving it undone. Others sprayed the trunk where there was no scale and left the boughs alone, though they were full of it.

Crude petroleum should be applied with great care; it seems to be perfectly safe when used for apple trees, which stand it better than any others, but is very dangerous for peach trees. I have never seen an apple tree which has been injured by it in this country; in New Jersey some trees have been killed, but it was not the crude petroleum that was used. I have found better results from it than from whale-oil soap, and it has also the advantage of being cheaper. The combination of soap and oil is a remedy which requires to be worked out. I am doubtful about it at present but I believe that it will yet prove an excellent remedy when the right proportions have been ascertained by experiment. Fifteen per cent, crude petroleum with water kills the scale but endangers the tree; 25 per cent. with 1 lb. whale-oil soap and a gallon of water is effective and not injurious to the same extent.

Lime, salt and sulphur as a remedy I like very much, but it is difficult to prepare; it requires some convenient mode of cooking, which is the important part, and the apparatus necessary for this is not always to be had. When cooked half a day, using lime that had been slacked in boiling water, it worked well, and so whitened every part of the tree that it reached that its application could be clearly seen; no portion of the tree should be left untouched. The reason this wash is so much more effective in California is because there are no heavy rains there to wash it off. Still, it can be used to good purpose here. Last May was very wet, and it began to rain while we were treating some trees and continued for a long time, yet the wash was successful, and we expect still better results in dry weather.

Fumigation with hydro-cyanic acid gas we tried at different points and at different times during the season, beginning in April and continuing till September. Over 300 trees were treated and a single live scale cannot be found on one of them. In the orchards trees affected by scale were marked and fumigated, the rest were sprayed. It is a troublesome and expensive remedy, but it will pay the fruit-grower to use it, when he would otherwise lose his trees.

If crude petroleum is applied to the trees as late as possible before the buds open in spring it covers the parts treated with a film of paraffine which remains on the trees during most of the summer and effectually keeps off the scale.

Hon. J. Dryden : Which treatment would you put first? Can you depend on any of them to destroy the scale ?

Mr. Fisher : There is no doubt that crude petroleum is the best for destroying the scale, but it cannot be used with safety on some trees. I should not think of using it on peach trees which were in any way weakened ; it should only be applied to the most healthy and vigorous trees. It can, however, be safely used on apple, pear and most plum trees, but not on Japanese or egg plums. Where it can be trusted its effect on the trees is very good indeed. One great difficulty is that the ordinary nozzles are too coarse. I should much prefer a finer one than those made. (Here he exhibited three nozzles—one made by the Spramotor Co., of London, Ont., the other two finer ones that were made by a watchmaker according to his instructions).

Whale-oil soap is a very useful remedy for peach trees which would not stand the petroleum treatment. It should be thoroughly applied until the trees are completely saturated and the scale is entirely soaked. The difficulty regarding it is that it is too expensive. It costs 12 cents for soap to spray each peach tree, while the crude petroleum would only cost 2 cents. A combination of the soap and the oil would cost from 4 to 5 cents. The lime, salt and sulphur wash, taking the lime at 12 cents, the salt at 8 and the sulphur at 30, would cost 1 cent per gallon or 2 cents per tree, using two gallons to a tree. Fumigation costs from 15 to 17 cents for the chemicals required for a full grown peach tree.

The peach tree grower should allow the branches to grow close to the ground without a long trunk, the lowest branches being only a foot above the surface. This produces a tree which is better than a tall one for picking, for spraying, for fumigation and for obtaining shelter ; it also has no long trunk for harbouring borers.

He found that in using crude petroleum with 20 p.c. water more trees were killed by the Ontario oil than by the American, the latter being much heavier. The specific gravity of the Ontario oil was 39½ and that of the American 44½. The former was procured from Wallacetown, Ont., through David Barr of Dutton, and the latter from Titusville, Penn. Undiluted oil sprayed with an ordinary nozzle would kill all trees.

The speaker then gave an account of some of his experiences during the past season. One instance was an orchard at St. Catharines in which he treated a block of trees ; these are all healthy now, while east of them, only twenty yards distant, there are three or four rows of peach trees which were partially treated by the owner and have since all died.

Near Niagara 370 trees, plum and pear, were inspected on September 20th and found so much infested with scale that they could not stand them during the remainder of the season and the fruit was no good. He made a light application with 25 gals. crude petroleum, half a pint to a tree diluted with 25 p.c. of water ; it did not hurt the trees and killed most of the scales. These trees will be treated again in the spring. The addition of water to the oil increases the volume and enables the oil to be more readily sprayed ; it soon evaporates and leaves only the oil on the trees.

I cannot—he said—recommend any remedy that will fit *every* case, nor any nozzle. These may be one-fourteenth inch, one-twentieth, one twenty-fifth, one-thirty-third, one-fiftieth and one-sixty-sixth. One-fortieth is a good size ; it makes a very fine spray, and the operator can regulate without difficulty the amount applied, as it works more slowly than a coarse one.

Mr. John Law : Does this nozzle ever get clogged ?

Mr. Fisher : No ; the pressure keeps it clear. A long extension pipe should not be used ; the shorter it is the better for satisfactory work.

After replying to several questions regarding spraying apparatus, materials and methods of application, Mr. Fisher said : I find now that there is an entire change of feeling amongst the

people. Two years ago they had not seen trees killed by the scale ; now such cases are frequent and they furnish an object lesson which cannot be misunderstood. Fruit growers who find the scale on their trees, realize that something must be done and done without delay. Experience now shows the wisdom of the methods adopted by the Department of Agriculture, though so much objection was made at first. The only sure and perfectly effective remedy is *burning up* all infested trees. Had we begun our investigations a few years sooner we should have succeeded in getting rid of the scale altogether in this Province, but when once introduced into the country it is no easy matter to trace its whereabouts.

In the fall of 1898 we started out with a long list of suspected nursery stock and on investigation found trees infested with the scale in 100 places. These trees were taken out and burned as fast as they were found, and now the localities where they grew are entirely free from the scale. This, together with the splendid work that has been done in the nurseries, has saved the country from a deluge of scale.

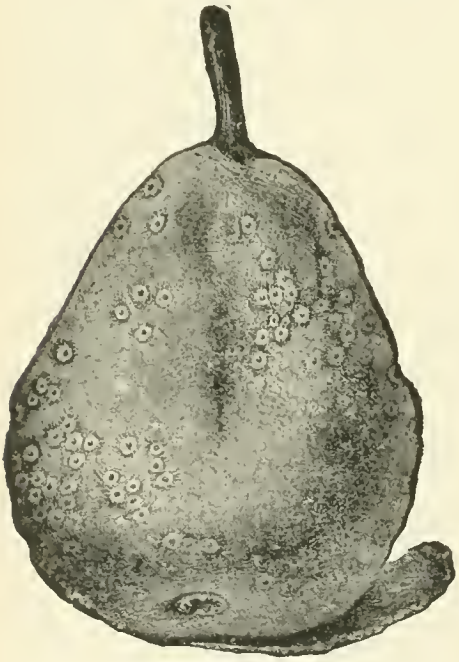


Fig. 1. Pear infested with the San José scale.

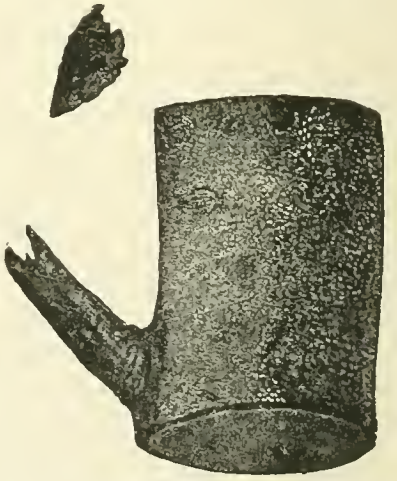


Fig. 2. Portion of a branch infested with the San José scale.

In the infested districts the increase and spread of the scale is very great indeed ; but where we have treated the trees, even for one year, the insect is under control. The situation is very much improved and I believe, from the results of our work, that by careful treatment we can control the scale and preserve the fruitfulness of our trees. Where good work has been done for one or two years, the results are such as to justify us in coming to this belief. If the treatment were universal, there would be no spread of the scale.

In answer to questions Mr. Fisher said that many who formerly objected are now treating their trees as they have learnt the necessity for it and seen the good results. The best time for treatment is the month of April. No body of men sent out from the Department of Agriculture could cover the affected territory within that month, it is therefore absolutely necessary that the work should be done by the owners of the trees, who are, of course, the parties most interested in the matter.

THE SAN JOSÉ SCALE IN OHIO AND IN ONTARIO.

Dr. Fletcher, of Ottawa, considered this meeting one of more than usual importance. No subject which had ever engaged the attention of entomologists could compare with that of the injuries done by the San José scale, and the finding of a practical remedy. The Federal, Provincial and State Governments in Canada and the United States had done everything possible to direct the attention of fruit growers and gardeners to the danger of neglecting this terrible pest and allowing it to spread through the country. Much good work had been done, but further experiments were necessary before a quite satisfactory answer could be given to the vital question: "Is there any definite, practical remedy for the San José scale?" He congratulated the Society that the Hon. John Dryden had considered the meeting of importance enough for him to leave his other work in a very busy department to come to London to encourage the Society and to hear the latest views on the subject. The leading entomologists of the world, in America, in Australia and in other countries were now directing their efforts to this very question of getting an effective, easy and cheap remedy for the San José scale.

The speaker had been fortuate enough recently to have an opportunity of going right through the infested areas in Ohio and Ontario and examining the experiments which had been tried to control it. In the first place, it should be stated that the San José scale only exists at the present time, as far as Canada is concerned, in one corner of the Province of Ontario, extending along the shores of Lakes Ontario and Erie in the Niagara Peninsula. The important experiments which had been carried on during the past season by Professor F. M. Webster in Ohio and by Mr. Geo. E. Fisher in Ontario were most instructive, and the results were really very similar in nature. In passing through these infested areas it was noticeable on both sides of the line that it was the same insect with the same habits in both places, the climate and the soil conditions were the same, and the fruit trees and fruit growers were identically of the same nature. The San José scale is without any doubt a terribly destructive insect, but it is so inconspicuous and difficult to detect when in small numbers, that there has been difficulty in getting farmers to appreciate how great the danger is. The great outcry nowadays is for definite information. The speaker claimed that the present occasion demanded, and he intended to make, very definite statements, founded on his recent investigations in Ohio and Ontario, and he knew these would be backed up and confirmed by Prof. Webster and Mr. Fisher, both of whom were present.

In the first place, with regard to the possibility of the San José scale killing trees in Canada. Many had hoped that Canada was too far north for the scale to increase rapidly enough to kill trees outright. In reply to this he had to say that he had recently seen plums and peaches which had been quite killed in two years from the time they were found to be first infested, and many other trees which, although not actually killed, were so seriously injured that they were practically useless. Even apple trees, which were thought to be much better able to withstand the attacks of the scale, were in many places, and particularly with some varieties, so much damaged that they were much disfigured by having a large number of their lower branches killed. It must, therefore, be concluded that the San José scale not only had killed trees outright in Canada in a very few years, but that its powers to increase and do harm are just as bad here as they are in other localities where it has gained a foothold.

The Ohio experiments, carefully planned and worked out by Prof. Webster and his expert assistants, showed plainly the benefit of special training in this kind of work. It was most noticeable that where orchards had been carefully sprayed excellent results had followed. This was particularly the case where the work had been done by the entomologists; however, where good practical fruit growers had carried out the instructions carefully the trees had been protected and paying crops had been secured. The advantage of experience was very

conspicuous in some of these orchards, the owners acknowledging that, although they thought they had done good work the first year, they were now able themselves to see that the second year's work was far better done than the first and they would be in a better position again next year to do the work better and more thoroughly. Some fruit growers had sprayed their trees in a perfunctory manner and had done little good. Spraying, to be effective, must be done with the greatest care as to every detail and with the greatest thoroughness, so that every part of the tree may be treated with the application. There are of course difficulties in spraying as well as in every other operation which is worth doing ; not only must the apparatus be of the very best, but the materials must be of the proper kind and mixed in exact proportions. The applications must be made at special seasons of the year, and it will pay fruitgrowers to see to this important operation themselves.

With regard to a definite remedy, Dr. Fletcher claimed that a definite remedy for the San José scale had already been given to the country. There was nothing particularly new as to methods of work nor which could not be found by everyone in the report of the Inspector of San José scale, which was available for all who would ask for it from Mr. Dryden's department. This was published last spring, and was a most valuable report. It was very regrettable that so few people who owned orchards seemed to be aware of its contents, or there would not be so many enquiries for a definite remedy when the good results given in that report showed that paying crops could be grown in orchards infested with the San José scale if they would regularly apply the remedies which were recommended by Mr. Fisher. In passing recently through infested areas, the fact was borne in upon him that if trees were treated every year, either with the whale-oil soap solution or the crude petroleum application, or, where the size of the trees would allow of it, if they were fumigated every year, paying crops could be grown, and he believed that the trees would year by year become freer from this pernicious enemy. Where trees had been neglected for only a single year, they had become coated with the scale so as to be almost or quite as bad as they were before they were treated.

The three remedies which the speaker claimed were definite practical remedies, were as follows :

(1) Whale-oil soap. This is a potash fish oil soap which can be purchased of good quality of some Canadian firms, of W. H. Owen of Catawba Island, Ohio, and of Good & Co. of Philadelphia, or it can be made with care and with a great deal of trouble by a private individual. To be effective, this mixture must be made of the strength of two and one-half pounds of whale-oil soap to the imperial gallon of water. To dissolve thoroughly, it must be mixed with hot water and is best applied just before the buds burst in the spring. Although, as a general statement, orchards treated with this soap mixture were not so free of the scale as those which had been treated with crude petroleum, still at the same time it was a fact that the two cleanest of those orchards lately examined which at one time had been infested and had been subsequently to a certain measure cleaned up, had been brought to their present good condition by the use of whale-oil soap. There were no very bad trees in these two orchards and scales could only be found with difficulty.

For peach trees this remedy is decidedly the safest to use. Its only drawback is the cost of the material. In large quantities it can be purchased, or made, for about 3½ cents a pound, and of the strength above advised it would require one and a half gallons of mixture containing 3¾ pounds of soap to an average size full-grown peach tree, making about 12 cents for material to each tree. The great advantage is that there is no danger of injuring the trees, and, further than this, the amount of potash in the soap makes it a decidedly beneficial application as a fertilizer.

(2) Crude petroleum. This mineral oil is decidedly more fatal in its effects both upon the scale insects and upon the trees. There are some matters connected with the effect of crude oil upon various fruit trees which still require elucidation, but both Prof. Webster and Mr. Fisher are

working hard on this subject, and, from the progress which has already been made, it is probable that before long their careful experiments (which it is of the utmost importance should be continued) will give results by which the danger of injuring the trees by inexperienced workers will be reduced. Crude petroleum may with care be applied to healthy peach trees as strong as 20 or 25 per cent. of a mechanical mixture with water, but it is very difficult to mix properly, and if applied carelessly or by reckless or inexperienced men there is great risk of the trees being killed. It is not always easy to detect when a tree is enfeebled, and injury may sometimes result to trees which are apparently healthy, but which on examination will be found to have suffered from some other cause. In applying crude petroleum, experience seems to show that one great difficulty is to get a pump which will always throw the exact percentage of oil that is shown by the oil gauge. A perfect pump has never yet been produced and this has always been a difficulty. When in Ohio recently, the speaker was much pleased to hear the London Spramotor Co. pump spoken of in the highest terms, but even this is susceptible of considerable improvement. Another danger may arise from the operator going over his work twice, and of course in that way depositing on the tree twice the percentage of oil necessary. Mr. Fisher's plan is to use not more than one quart of crude oil costing 2 or 3 cents to each tree. The crude petroleum has two great advan'ages over other remedies if experiments will show us how we can use it without danger to the trees. It is exceedingly cheap, and it leaves a deposit on the trees even after the volatile portion has evaporated. This deposit is vaseline and has the double advantage of showing clearly on the trees what parts have been sprayed and at the same time rendering the bark unsuitable for the young scales to settle upon.

[Some striking examples were here exhibited of bark taken from the two sides of a badly sprayed tree, one showing plainly the residue of the petroleum and no living scales, the other showing no sign of oil and thickly caked over with living scale insects. One piece of bark had on one side of it masses of dead scales as far as the oil had reached and beyond that, where there was no oil, a thick coating of living scale insects.]

Crude petroleum, therefore, is an effective remedy, but great care must be exercised in using it. The great danger will be next year. Carefully watched over and helped by Prof. Webster and his assistants in Ohio and by Mr. Fisher and his assistants in Ontario, remarkably good results have been obtained by some fruit growers; very little harm has been done to peach trees and none at all to apple, pear and plum trees. This state of affairs might probably engender a spirit of recklessness, and the speaker was afraid that next year there would be much loss from fruit growers using the crude oil recklessly or carelessly. There was no doubt at all that many who had even purchased crude oil this year had abstained from using it, for fear of injuring their trees, but had watched the outcome of their neighbours' experiments. As no cases of injury had occurred, a great many trees would be treated next year. It was therefore most important to advise caution.

(3) Fumigation. The most effective remedy is fumigation with hydrocyanic acid gas, which will destroy every living insect, but which if applied as recommended will do no harm at all to the trees. For small trees this has proved very useful, but for large trees the necessary tents and apparatus are expensive and there are difficulties which have yet to be overcome in the way of getting the gas equally diffused beneath the tents.

Summing up what he had brought before the meeting, Dr. Fletcher claimed that, notwithstanding the great danger which still exists from the presence of the San José scale in Canadian orchards, the experiments of entomologists had provided remedies which were as practicable and as effective as those which were used for many other injurious insects, and that by their regular use trees could be kept in health and in a bearing condition. He would not believe that the extermination of the San José scale from Canadian orchards was an impossibility. What could be done on one tree could be done on many. Combination, and

co-operation were what was most needed in this matter, and, in the same way that farmers did not nowadays thresh their own grain but had this done for them by men who made a special business of doing it, he looked forward to the time when expert sprayers who knew their business, would travel from place to place spraying orchards for the various insect enemies. By this means, better work would be done and at a smaller cost than if each fruit grower did his own work Fruit growers must remember that the application of these remedies was no easy matter which could be attended to by an untrained man. The Ohio and Ontario work were one huge experiment which was being keenly watched by scientific men and political economists. It was not a matter of the prosperity of a few individuals and the protection of their orchards, but of the discovery of a practical means of saving one of the most important industries of the country. This was not to be calculated by a few thousand dollars but by millions, as any one could see who would consider the amount of capital invested in orchards in Canada and the United States and then visit the dying neglected orchards.

It was a matter of congratulation that Prof. Webster was present ; he is one of the most highly esteemed of the scientific workers in entomology in the world and has taken up this matter ; nor was the Province of Ontario less fortunate. Mr. Fisher's enthusiasm and his peculiar adaptability for the delicate and difficult work which he had undertaken were apparent to all. The speaker trusted that these gentlemen would continue their important experiments in the directions which they had explained to him, and he felt convinced that substantial advance would be the result of another year's investigations. The Society had invited Prof. Webster to be present at this meeting, knowing that his advice and suggestions would be of extreme value. Mr. Fisher has been for some years a member of our Society, and we all know how reliable he is.

Professor Webster, of Ohio, was next called upon to address the meeting. He said that the problem they had to solve in Ohio was exactly the same as in Ontario, and it was the most tremendous the world had ever had to face as regards insects. He was constantly asked for a *cheap, easy and perfect* remedy, but such was not to be had ; how ver nearly it approached perfection it could not be easy nor could it be very cheap. Machinery was required which could not be produced in a day, but would be the result of long-continued experiments and constant improvements. He had not yet been able to find a good sprayer ; the best so far made [it was gratifying to hear] was made in London, Ontario, by the Spramotor Co., but it was capable of improvement. In time, no doubt, we shall get what we want. It was the same with insecticides ; we have not yet found out the very best materials and their combinations.

We know that countries differ, and that fruits which flourish in one region cannot be successfully grown in another. And so it is with insects ; they vary very much in numbers and in injuriousness in different localities ; some, for instance are destructive in Southern Ohio which do no harm in the northern part of the State. What people expect us entomologists to do is to provide them something that can be put in an orchard at no cost, and with no attention will kill all the noxious insects and not affect the beneficial ones.

(He then described the construction of fumigating houses, and stated that they had made them with slatted floors so that the deadly materials could be shoved under without danger.)

In addition to good apparatus, trained men were also wanted in order to do the work properly, just as skilled men were required for driving an engine. Such men should be provided with good machinery and then go about the country. They could do the work far better and much cheaper than untrained men ; there was an opening here for a paying occupation. And it was one in which almost continual employment could be obtained ; for instance, in July there would be the spraying of vineyards with Bordeaux mixture, later on the fall treatment for scale, all winter the same treatments, in the spring spraying for codling-moth, plum curculio, etc., then Bordeaux mixture, and so on—something to do nearly all the year round.

In Ohio, trees hopelessly attacked with the scale are marked for destruction and the owner is compelled to destroy them. Others less badly infested must either be destroyed or sprayed with whale-oil soap or crude petroleum and water, and the owners are held responsible for any damage arising from neglect.

At the present time, if remedies are properly used, we can reduce the scale 90 per cent. in one year ; the other 10 per cent. cannot be exterminated. One tree might be absolutely cleared of the scale, but a whole orchard cannot. The condition of vitality of the trees makes a great difference. Thrifty young peach trees will stand 25 per cent. to 30 per cent. crude petroleum, while older and feebler trees were killed with 25 per cent. He now uses 20 per cent. of oil with one pound of whale oil soap. On the whole he considered that we are getting on as well as we can possibly expect.

Dr. Fletcher : Why cannot we kill the last 10 per cent. ? If we spray with crude petroleum this year there will be a covering of vaseline left on the trees ; this will be increased the second year and the third, and at length the tree will become unsuitable for the scale and free from danger of attack.

Prof. Webster : There is no difficulty in treating apple-trees in this way and securing immunity ; but I was speaking of peach-trees which cannot stand the same amount of petroleum. I agree with Mr. Fisher that the heavier oil is the most satisfactory.

Mr. Fisher stated that he had treated infested trees for three years in succession ; they recovered health and vigour, and bore fruit, and were not injured by the continuous treatment.

Prof. Lochhead expressed his sense of the importance of the subject under discussion and his appreciation of the value of the information that had been imparted by the speakers.

Hon. J Dryden said that he had listened with great interest to the excellent addresses of the speakers, and was rejoiced to learn that definite measures for the extermination of the scale could now be adopted. It was undoubtedly a most serious danger to the fruit industry of this Province, and every possible means must be employed for its removal. The difficulty at the outset was to persuade the public that this danger existed ; many people do not believe it even now. Nothing can be done to enforce remedies unless people believe in the deadly character of the scale. The application of the remedies must rest with the people themselves, but they must be taught what the remedies are and how they are to use them. This is what the Government should do and is trying to do.

But how are we to impress this upon the people ? The answer is by education—by teaching them first the danger and then the means with which to combat it. The Entomological Society and the Fruit Growers' Association could do good work in this respect. Every fruit grower in the Province must be impressed with the danger to his own fruit and also to that of his neighbour, if this scale is not repressed. At the beginning of the operations for its extermination, drastic methods were adopted because it was supposed that the scale was confined to a few spots only, and we wished to exterminate it. This system was continued till considerable opposition was aroused and some excitement was created. An endeavor was made to find out the range of the insect and what the cost of its extermination would be ; if the information received was correct, $300,000 would have been required for compensation. If half a million dollars would wipe it out now the Government would gladly pay it. At present we are trying to hold it in check and to prevent its spread.

Educate, educate, must be their watchword. From now on we must strive to teach people about this scale—how to deal with it and what the danger from it is. It would be a great thing to teach people how to spray by sending competent men about whom they could *see* doing it ; no matter how plain written directions might be, they were of little use unless people were shown how to do it. This was the experience in improving the butter-making of the country.

The great danger lay in our nurseries, from which scale-infested stock might be sent out and the insect planted all over the country. We had an instance of this in the 100 trees two

years ago to which Mr. Fisher has referred. How is this danger to be overcome? Inspection alone is not enough, as some scales in a nursery may be overlooked even by the keenest inspector. The only plan then is to require compulsory fumigation of all nursery stock before it is sent out, and this must be done by a man sent by the Government, who shall see that the fumigating house is perfect and the work perfect. This is all that we now have to prevent with certainty the dissemination of the scale, but we shall have to go further and allow no stock to be sent out of a nursery that is in an infested district.

It is desirable that further experiments should be made with the gas treatment. The ordinary man will not believe that infested trees in the middle of a waggon load and tightly tied together can be reached by the gas. This should be tested. The fumigating house must be constantly inspected to see that there is no leakage, and this work must be done by an officer of the Government.

On the whole Mr. Dryden felt that we were in a better position now than this time last year, and he felt very hopeful for the future. He had great confidence in the efforts that were being made for the preservation of our fruit trees, and believed that if the danger were once fully and generally realized, our fruit-growers would spare no efforts to exterminate the scourge.

Prof. Webster stated that he had tried infested trees soaked in water and others daubed with mud, and in no case had a scale got through the fumigating house alive.

Hon. J. Dryden: There are thousands of trees in a nursery. If there should be only two or three scales on a small tree, how can inspectors tell their presence? It is therefore absolutely necessary to resort to fumigation.

Dr. Fletcher quite agreed with this, but considered the inspection of nurseries most important for the discovery of infested places and he believed it to be a very wise provision.

Mr. Fisher said that an experienced inspector could discover the scales in a marvellous way, and would often detect them where the owner of the trees failed to see any. With regard to the 100 trees destroyed, already referred to, he considered that the destruction of each one was worth a thousand dollars to the country.

EVENING MEETING.

A meeting, to which the members of the London Horticultural Society and the public generally were invited, was held in a lecture room at the Normal School. Notwithstanding the inclemency of the weather, the first snowstorm of the season prevailing at the time, the hall was completely filled by a very appreciative audience. At 8 o'clock the meeting was called to order by the President, Rev. Dr. Fyles, South Quebec, who spoke of the honor done to the Society by the presence of the Hon. John Dryden, Minister of Agriculture for Ontario, and by his kindly consenting to preside that evening.

The Hon. J. Dryden then took the chair and delivered the opening address. He said that he esteemed it a great honor to preside over a meeting of the Entomological Society, which was one of the best as well as the oldest of the associations aided by the Government of Ontario. It had always been composed of gentlemen of wealth, of education, and above all of public spirit, who were willing to devote their time and ability to the objects of the Society. While it was one of the oldest, it was also one of the most useful associations connected with his Department in the opinion of a practical man like himself. We need its accurate work and we have been greatly aided and helped by it during all the nearly forty years of its existence; no doubt we shall continue to be helped by it during the years to come. He was present at this annual meeting to show his interest in the Society, and the interest which was taken in it by the Government and the Legislature of Ontario. He should like to inspire everyone with enthusiasm in the work of the Society which was doing so much for the country by its studies

of insect life both in its destructive and beneficial aspects. He congratulated the members on their extensive collections of insects and their library, which was the best of its kind in this country, and would be found most useful by young men of scientific tastes.

The Rev. Dr. Fyles, of South Quebec, read his presidential address and illustrated it with a number of beautifully executed colored diagrams, the work of his own hand. His charming manner and choice diction added to the interest of the subject, and held the unflagging attention which was bestowed by the audience.

THE IMPORTANCE OF ENTOMOLOGICAL STUDIES TO THE COMMUNITY AT LARGE.

By the Rev. Thomas W. Fyles, D.C.L., F.L.S.

The poet Crabbe gives us a glimpse of an entomologist of his day. He says,—

"There is my friend the Weaver: strong desires
Reign in his breast; 'tis beauty he admires:
See! to the shady grove he takes his way,
And feels in hope the raptures of the day—
Eager he looks: and soon, to glad his eyes,
From the sweet bower, by nature form'd arise
Bright troops of virgin moths and fresh-born butterflies;

* * * * * * *

"Above the sovereign oak, a sovereign skims,
The purple Emp'ror, strong in wing and limbs:
There fair Camilla takes her flight serene,
Adonis blue, and Paphia silver-queen;
With every filmy fly from mead or bower,
And hungry Sphinx who threads the honey'd flower."

Crabbe wrote in no unkindly spirit, for he was himself a naturalist; but, by the general public of his time the entomologist was regarded as one who rode a useless hobby, as one who wasted his time in trivialities.

Yet, doubtless, it was better that the weaver should spend his leisure hours in the woods and fields, improving his health by exercise and fresh air, and having a definite purpose in view, than that he should idle them away in the frouzy haunts of men of his class. We may well believe that he would return to his usual avocations with greater courage, because of the pleasure and refreshment that his outing, amid—what Hood calls,—

"The boundless prodigality of nature,
The balm, the bliss, the beauty and the bloom,"

had given him.

For some years before Crabbe's death, the friendly Stephens, to benefit just such entomologists as Crabbe had portrayed, opened his doors on every Wednesday evening, and received both acquaintances and strangers alike—placing his books and his fine collections at their service, identifying specimens for them, and giving them scientific information.

Stephens died in 1852: but the Wednesday evening "at homes" were continued by Stainton, editor of "The Entomologist's Weekly Intelligencer," at his residence at Lewisham.

The services rendered to the cause of English entomology by Stephens, Stainton, Newman,* Douglas,† and others of their time, ought never to be forgotten. They raised entomology in public estimation; they changed many a mere collector into a useful man of science; and they prepared the public mind to welcome the publications of the entomological authors who came after them.

I think Stainton's "Manual of Butterflies and Moths" (in two volumes) was the most complete work of the kind—the best adapted to its purpose—that had then appeared. It was

*Editor of the "Zoologist" and author of the "Insect Hunters," etc.
†Author of "The World of Insects," etc.

cheap, readable and concise, sufficiently illustrated, and systematically arranged. It contained descriptions of larvæ, pupæ, and perfect insects, with the dates of their appearance and the localities, known to the author, in which they could be found. It also gave the names of the food-plants of the larvæ.

In 1859 Dr. Breckenbridge Clemens wrote to Stainton from Easton, Pennsylvania, and said : "With us (in America) everything has yet to be done." He also told of efforts that the authorities of the Smithsonian Institution were about to put forth ; and he predicted a bright future for American entomology. His prediction has been amply fulfilled.

In all probability Stainton's work was well known to the founders of our own society which is now in the 38th year of its existence, and which has done so much good. Some of the original members of the society are still among us. Long may they live ; and may their influence be felt in ever-widening circles !

I do not doubt that there are many to-day, especially among the young, who are, as yet, mere collectors. They stand, so to speak, within the vestibule of the Palace of Science, and they should receive a hearty welcome, and be encouraged to go forward, for there are noble apartments, well-furnished, open before them, and the farther they go the better they will be entertained.

The collector will soon wish to learn the names of his captures, and then the proper position of each with regard to the others, and so Systematic Entomology will engage his attention. I would, therefore, urge parents and teachers to encourage a taste for Natural History in the young people under their care ; and I would adopt the words of Warwick James Price and say, Here's to the school-boy—

"Who one day in seven
Slips off to the country to find it a heaven,
And reads in the sunshine, the fields and the brooks,
A wisdom the truest, not printed in books."*

The tyro in entomology in this city has a very great advantage in being able to examine the Society's collections, in which a vast number of our Canadian insects are correctly arranged in their orders, tribes, families and genera, and are beautifully kept by our curator, Mr. Alston Moffat.

But I need not say that the Entomological Society of Ontario has far higher objects in view than those that appertain to Recreative Entomology and Systematic Entomology. Let any one examine its thirty-one annual reports, and he will find that what is known as Practical or Economic Entomology has received from it a vast amount of attention. It has investigated the habits and traced the life-histories of creatures that affect our growing crops, our stores and home-supplies, our live-stock, and our domestic and personal comfort ; and it has spread most valuable information as to the best methods of dealing both with our insect friends and insect foes. There is much that comes under the head of Practical or Economic Entomology to interest us all.

The subject of the Agency of Insects in the Fertilization of Blossoms has been brought before us by such writers as Percy Groom and Grant Allen ; and many interesting enquiries in this direction present themselves. For example : How is it that the Quebec farmers have to send elsewhere for their Red Clover Seed ? They can grow fine crops of Red Clover hay—why do they not raise the seed ? The answer may be given as follows :—

The insect that affects the fertilization of the Red Clover is the Humble Bee. On the approach of Winter all the Humble Bees perish, except one or two impregnated females from every nest. These creep into snug refuges and hibernate. The winters in Quebec are severe, and linger long ; and the few Humble Bees that survive them do not commence operations till

* "The Munsey," July number, 1896.

the very end of May. They have then to form their nests, collect bee-bread, and lay their eggs; and some time elapses before the working-bees begin to appear. Vegetation on the other hand proceeds with astonishing rapidity—with leaps and bounds ; and the clover fields are in bloom before there are Humble Bees in sufficient numbers to accomplish the important work designed for them ; and so the clover blossoms are, in the main, unfertilized, and afford but little seed. The season is too short to allow the ripening of seed in the rowen or after-math.

The Humble Bees are among our best insect friends ; and yet how many a farmer on discovering a humble-bees' nest becomes possessed with an insane desire to destroy it.

The rough coats of bees are admirably suited to sweep the pollen from the anthers of flowers, and to convey it from blossom to blossom.

The pollen of plants is in itself well worthy of examination. It presents a remarkable variety both in form and color, as a few descriptions will show :—

The pollen-grains of the Orange Lily are ellipsoid, and of a deep Indian red.

Those of the Sun-flower are globular, and of a golden yellow.

Of Geranium the grains are round, warty and of the color of raw sienna.

Of Malva, the grains are round, set with spines, and of a pearly white.

The Sweet-pea has pollen-grains oblong in outline, and of the colour of amber.

The Petunia has grains egg-shaped and of pale lilac.

The pollen-grains of Mignonette are of a long oval, and are flesh-coloured.

A wide and interesting field for investigation is presented to the Entomologist and Botanist in the subject of the fertilization of blossoms by insect agency.

Scientists have of late made considerable advances into a field which, though not altogether unrecognized, had been but little explored—that of Medical, or Hygienic Entomology. Physicians have long studied that part of it which comes under the head of Dermatology, and have also written much upon internal parasites ; but the subject of the spread of disease by the agency of insects has not until lately, entered largely into their studies.

Forty years ago a French-Canadian gentleman told me of a person who had died of "Charbon," resulting from the bite of an insect. He explained to me that the insect had, in all probability, made an attack upon a diseased animal before assailing the man.

In conversation with others, and in the course of years, I have heard of other cases of this *Charbon* or *Anthrax*, produced by insect agency.

That this terrible disease may be readily conveyed to human beings may be learned from the case of Mrs. Mary O'Neill, of Titusville, Pa. She, having washed the soiled linen of her husband who had handled infected hides in a tannery, was taken with anthrax, and died in a few days in great agony.*

The panic that ensued on the spread of the information that several persons had died from the assault of an insect popularly called the "Kissing Bug," viz.: *Melanolestes picipes*, Herrich-Schæffer, had at least this good effect—it drew the attention of Entomologists more closely to the subject of the spread of disease through insect agency.

Important investigations have been made as to the spread of malaria through the bites of mosquitoes ; and the timely publications of Dr. Howard, of Washington, D.C., have thrown much light upon this subject, and given valuable information upon the various kinds of mosquitoes found in North America and their habits. His work (published by McClure, Phillips & Co., New York) should find a place in every Naturalist's library.

The ever-present House-fly, *Musca domestica*, has, under like investigations, risen in public recognition from a merely troublesome household pest, into the "bad eminence" of a possibly dangerous foe. It is found that it is capable of conveying the baccilli of disease from the sick chamber to the kitchen and the dining-room. For valuable information on this point I would refer

*Quebec Morning Chronicle, Sept. 16th, 1901.

you to a paper by Dr. Howard in Bulletin No. 30, New Series. U. S. Dep. of Agr.; one by Dr. Smith Ely Jelliffe in "The Munsey" for August of this year, and one by Dr. Fletcher, No. 3, vol. XXXIII of "The Canadian Entomologist."

We are beset by these insidious foes; and those who tell us of the dangers from them are public benefactors. "To be fore-warned is to be fore-armed."

Flies come from without; and pains should be taken to keep them without—as may be done by the use of gauze blinds and doors. Those that enter should do so to their destruction. Now that the fly-papers known as "Tangle-foot" are so cheap, and so effective, it ought not to be very difficult to keep the house free from flies.

Another subject that should raise the science of Entomology in the estimation of the public is that which may be called COMMERCIAL ENTOMOLOGY. And by this I do not mean the traffic in insects between dealers and collectors; though there are firms both in America and Europe doing a considerable business in this line. I have the price-list of an English firm before me; and it is curious to note the amounts asked, per pair, for some of our Canadian insects:—

For *Papilio Turnus*, 3s. 6d.
Colias Eurytheme, 1s.
Argynnis Atlantis, 5s.
Melitæa Phaeton, 1s.
Hemaris Thysbe, 3s.
Deilephila lineata, 2s.
Sphinx luscitiosa, 8s.
S. drupiferarum, 6s.
Ctenucha Virginica, 3s.
Prionoxystus robiniæ, 10s.

The covers of our Entomological magazines by their advertisements and notices, show that this kind of traffic is widely carried on.

No, I do not refer to this traffic when I speak of *Commercial Entomology*; I refer—

1st, To the unintentional transportation of insects from foreign lands by shipping, and their trans-continental conveyance by train, etc.

2nd, To the importation of insects, and insect productions, as merchandise.

(1) One night, in August last, my business took me along one of the wharves of the Louise Basin at Quebec. On one side of my path was a long store-house; on the other was an ocean steam-ship discharging her cargo. The whole scene was brilliantly lighted with arc lights attached to the building. I paused under one of the lights to notice the water-flies that had been attracted by it. Besides these, there were a few moths and a number of cockroaches (*Blatta orientalis*, Fischer). The last had, I doubt not, come from the ship. And I was reminded by them that their species was brought to England by ships trading to the Levant; and from England they have been sent to many lands. They have of late years become exceedingly numerous in Quebec.

Fig. 3. Cabbage Butterfly (*Pieris rapæ*).

House-flies have been carried in ships even as far as New Zealand; and where flies are found, there we may expect to see spiders. So we do not wonder that Henry Christopher McCook writes:—"Some of our American spider species have been imported from Europe, and I have seen them on vessels stowed away in divers crannies, and under sundry parts of the ship."*

Of imported insects that have made a stir in Canada, the Cabbage Butterfly (Fig. 3), the Larch Saw-fly (Fig. 4), the Mediterranean Flour Moth (Fig. 5) and the San José scale are examples too well known.

* *Old Farm Fairies.* Appendix, Note C, p. 18.

It is probable that *Zeuzera pyrina*, Fab., (The Leopard Moth), *Porthesia auriflua*, W. V., (The Brown-tail Moth), and *Ocneria dispar*, Linn, (The Gypsy Moth), will some day find their way to Canada, as they have effected a lodgment in the States.

I am sorry to record the advent of the Buffalo Carpet Beetle (*Anthrenus scrophulariæ*, Linn), to the Province of Quebec. I found it last July at Lennoxville and also at Sherbrooke. It had, I suppose, been conveyed to Canada in woollen goods from the United States.

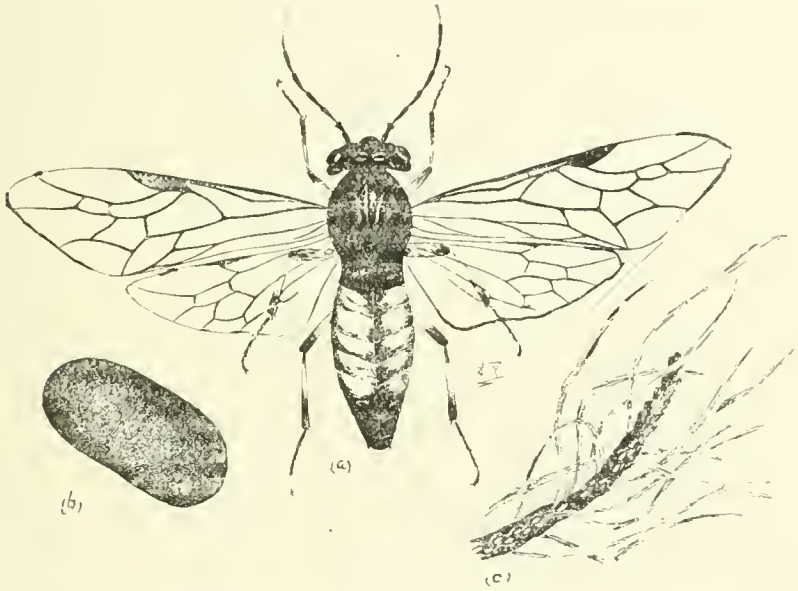


Fig 4. The Larch Saw-fly, cocoon and eggs.

It is worth a degree of attention that we cannot now give, as to whether the set of insect migration was originally from West to East, or from East to West ; and how far the great land features of this continent have checked the spread of immigrant species ; and to what extent climatic and other influences have affected their form and coloration.

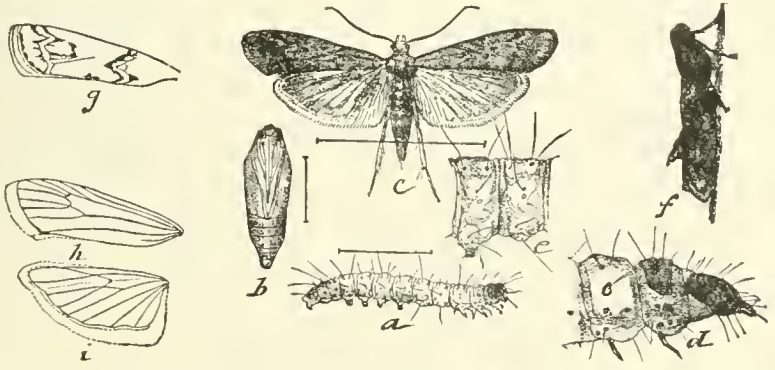


Fig. 5. Mediterranean Flour-Moth.

Some species of our British Columbian insect fauna seem to me to have a much nearer general resemblance to European species, than to those of Eastern Canada and the New England States. For examples :

Parnassius Clodius, Men., has a likeness to *Parnassius Apollo*, Linn.

Anthocharis Ausonides, Bdv., to *Pontia Daplidice*, Fab.

Melitæa rubicunda, H. Ed., to *Melitæa Artemis*, Fab.

Cœnonympha inornata, Edw., to *Cœnonympha Pamphilus*, Westwood.

Such questions as these might come under the head of GEOGRAPHICAL ENTOMOLOGY.

But it is (2) to the importation of insects and insect productions as merchandise that I would more particularly draw your attention. And first to the importation of silk and silken goods.

The silk manufacture has been carried on in China from time immemorial. Its beginning—like that of the cultivation of grain—has been lost trace of in the lapse of ages. In the third century of the Christian era, silk brought to Europe was of so much value that the Emperor Aurelian (most ungallant of men !) refused his wife a silk dress, on account of the cost.*

In the 6th Century two Eastern monks visited India and acquired a knowledge of silk culture. They secreted eggs of the silk-worm moth in the heads of their walking-sticks, and carried them to Constantinople. In the neighborhood of that city silk-culture was first practised. From thence it spread to Italy, and subsequently to France. On the revocation of the edict of Nantes in 1685, 70,000 Huguenots sought refuge in England and Ireland ; and some of them established the manufacture of silk at Spitalfields and Derby.†

In the days of Queen Elizabeth silk-stockings were a costly luxury ; and it is said that James VI of Scotland, on one occasion, borrowed a pair from the Earl of Mar, that he might present a respectable appearance before the English Ambassador.‡ In the fiscal year ending June 30th, 1899, the people of Canada indulged in silk hosiery to the value of $4,119.

The total value of silk goods imported to Canada in the year mentioned was $3,753,539, on which custom dues amounting to $1,091,218.29 were paid.

Next in importance to the traffic in silk and silken goods comes that in honey and wax.

In Canada itself Bee-culture has been raised to great perfection ; and vast quantities of wax and honey are obtained. But the home supplies are not equal to the demand. And so we find that, in the year mentioned above, 33,564 lbs. of bees-wax were imported from the United States. The value of this was $8,941 ; and upon it $894.10 was paid as duty. Of honey and "imitations thereof" 83,888 lbs. were imported—the value of which was $8,579, and the customs duty $2,482.97.

The importations of honey were of course small to those Provinces in which the home supplies were large, and, *vice versa*, large to those whose home-supplies were small, or altogether wanting. Thus by Ontario 98 lbs. only were imported, while to British Columbia 32,487 lbs. were sent ; and to the Yukon, 49,694 lbs.

Large quantities of wax are used in the manufacture of candles for use in the elaborate ritual of the Roman Catholic Church. I lived for some time near a manufactory of these candles. The yellow wax came in sheets, which were blanched by being spread upon the grass and exposed to the air and the sunshine.

Next in importance to the trade in wax and honey is that in cochineal.

The cochineal insect, *Coccus cacti*, is raised in great numbers in Mexico. It is a suctorial insect, and its food-plant is the Nopal or Indian Fig, *Cactus cochinellifera*. Extensive plantations of cacti, or nopaleries as they are called, are formed on the mountain slopes ; and there the Indians locate, watch over, and at length secure their charge. In appearance the dried insects resemble shrivelled berries, or grain. They are of a mulberry colour, and have a whitish bloom. It takes 70,000 of them to the pound weight. Of the cochineal brought into Canada in the time mentioned, 2,512 lbs. came through Great Britain and 30,675 lbs. through the United States. The value of the whole was $1,708. According to the computation just made 232,309,000 dried Cochineal insects were brought to Canada in the year. The substance called Lac is a production of another Coccus, viz.—*Coccus lacca* which feeds on *Acacia arabica* and other trees. It is a

* Kirby and Spence's Entomology, Letter X.
† History of Insects, R T.S., p. 153.
‡ Kirby and Spence's Entomology, Letter X.

native of India. Insects of the species crowd together, puncture the bark of their food-plant, and gradually become encrusted with a resinous matter which exudes from their bodies. This substance comes to us in its crude state, and also under different forms as shell-lac, button lac, sheet lac, etc. It is used in the composition of varnish, sealing-wax, etc., and in the colour called lac lake. 146 lbs. of lac valued at $29 was brought into the Province of Quebec during the year mentioned, for home consumption.

One other production of insects must be mentioned here namely nut-galls, or Aleppo galls. They are caused by the punctures made by a Cynips, *Diplolepis gallæ-tinctoriæ* ; and they abound throughout Asia Minor. They are gathered by the inhabitants, and exported from Aleppo (hence the name), and other ports of the Levant. They are used for dyeing purposes and in the manufacture of ink. 534 lbs. of these galls were imported to Ontario in the year mentioned, and 13 296 lbs. to Quebec. The whole being valued at $1,065.

The total value of insects and insect productions admitted to Canada in the year ending June 30th, 1899, was $3,773,832, upon which duties amounting to $1,094,595,36 were collected. These figures show the importance to the community at large of what I have called Commercial Entomology.

But there are yet higher lessons to be learned in our consideration of insects than those which have reference to them as they affect our food supplies, health and business interests.

"All Scripture" we have learned "is profitable for doctrine ;" and in the "Book of Nature," there are many "parables" which illustrate and enforce Divine truths. The student of well-balanced mind cannot advance far in the study of insects without perceiving that they bear ample testimony to the fact that there is a Divine Intelligence, an all-wise, all powerful and beneficent being who has fitted them to their surroundings ; who has numbered their parts, and proportioned them with the utmost exactness ; who has made them beautiful in their season ; who has foreseen their requirements, and ordered all their ways, and whose goodness is over all His works. Who has, in short, made record of Himself in these, the works of His hands.

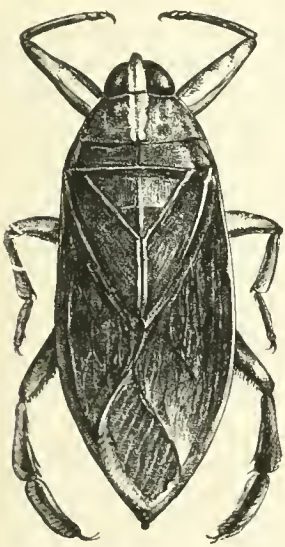


Fig 6. The Giant Water Bug.

(1) God has adapted the insect to its environment.

Take for example the Giant Water Bug, *Belostoma grandis*, (Fig. 6). This creature spends a great part of its existence in the water, but comes forth, in its perfect state, to seek a mate, and to move to other waters. It lives by suction, preying upon fish and other denizens of the pools and streams. It is necessary that it should be able to float on the surface of the water and to dive beneath it ; that it should have a quick sight, great powers of motion, a strong grasp, suitable breathing apparatus and mouth-organs, and powerful wings to sustain its large body in its aerial excursions. With all these it is admirably provided.

Its body is the shape of a well-proportioned wherry. Its hind legs are sweeps for propelling it through the water. The fore-legs are grapnels, ending with sharp claws, to enable it to hold itself against a current or to cling to its prey ; whilst the middle pair of legs serve to steady it, and also as rudders, to guide its course—the rudders of ships, you will remember were, in early days, placed upon the sides. The eyes of the bug are large and protuberant. The cornea is made up of a vast number of facets, which are hexagonal, and beautifully regular, both in size and shape. The proboscis of the insect is protected by a sheath or cover. The instrument itself is brown, and polished, and comes to a sharp point. Around the edge of the insect's abdomen, under its close-fitting wings, there is a smooth channel, though all the rest of the upper

side of the abdomen is covered with a thick brown pile, like that of plush. This channel is probably a receptacle for a supply of air, for use when the insect takes a plunge into the depths.

Who fitted the water-bug to the part it has to play? It did not fit itself. Man could not do so, any more than he, by taking thought, could add one cubit to his stature, or make one hair white or black. Did Nature? No—we do not deify Nature. There is a Divine Being who originated and controls natural forces—who designed this creature, so admirable in every part.

(1) The exactitude with which every species of insect is formed excites our admiration.

Consider the wasp (Fig 7). The male has 13 joints in the antenna: the female has 12—neither more nor less in either case. The male has invariably 7 segments in the abdomen, and the female 6. Then, moreover, the limbs of the wasp consist of five parts—coxa, trocanter, femur, tibia and tarsus; and in the tarsus there are five joints. Who counted out these things and fixed the rule? Who traced out the lines and spaces in the wings, so exactly that the species of the insect may be told from the wings alone? The same God of whom David wrote :—

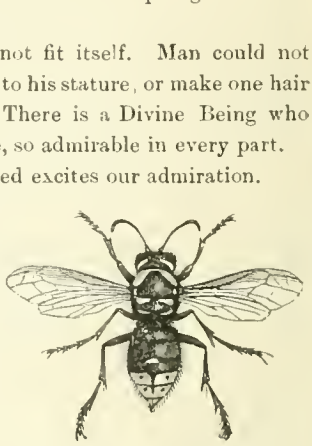


Fig. 7. A Wasp (*Vespa maculata*)

"Thine eyes did see my substance yet being unperfect; and in Thy book all my members were written which in continuance were fashioned when as yet there were none of them." Ps. CXXXIX, 16.

The God who counts and measures.

Who taught *Vespa Maculata* Linn. to build its wonderful nest of wood-pulp; and gave it the geometrical and mechanical skill to form its hexagonal cells (Fig. 8), and suspend them, tier below tier, in such a marvellous way?

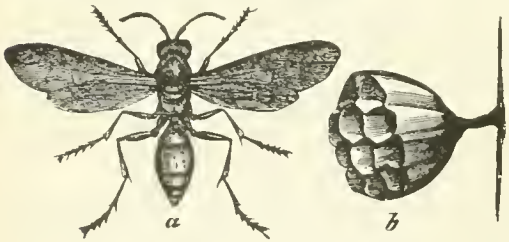


Fig. 8. Wasp (*Polistes*) and its Comb.

The same God, "Who hath measured the waters in the hollow of His hand, and meted out heaven with the span, and comprehended the dust of the earth in a measure, and weighed the mountains in scales, and the hills in a balance." Is. XL. 12.

(3) What exquisite beauty does the insect world display to the admiring gaze of men. Who was it gave to *Philosamia Cynthia* its lovely dress of fawn colour embellished with delicate mauve, and ornamented with the pale lunettes to which it owes its name?

And who gave to *Phlegethontius cingulata* its wonderful gradations of colouring—its rings and vandykes, its bars of black and carmine, and its white-spotted borders? It was that Beneficent Being who delights in beauty and grace, who in love to His creatures has made all nature—

"Beauty to the eye,
And music to the ear."

(4) In 1873, before the moth *Cossus Centerensis* had been named and described by Dr. Lintner, I found protruding from the trunks of Balsam Poplars growing on the banks of the Yamaska River a number of empty chrysalis cases of this species. I examined the bolls of the trees carefully and was rewarded by finding a fine female of the moth. I was not then sufficiently acquainted with the Cossidæ to know that this belonged to a new species I then peeled away some of the bark from one of the trees and found the mouth of a tunnel—over this I fastened a piece of netting—so as to form a bag; and, by this means, I secured a male of the species. I have the pair in my collection still.

Cossus Centerensis lays an egg in a crevice of the bark of a tree. The little caterpillar that comes from it bites its way into the wood. Its tunnel is at first a mere pin-hole, and is soon

closed by the *frass* it leaves behind it. As the larva grows it enlarges its tunnel till at length its instinct warns it to work upward and outward. This it does till it leaves only a film of bark between it and the outer air. It then retires some inches down its tunnel so as to be out of the reach of the sharp bill and long tongue of the wood-pecker. There it assumes its pupal form. When the time for the imago to appear approaches how can the footless chrysalis ascend its shaft and push its way through the screen of bark? Ah, that difficulty has been foreknown and provided against by Him, "who sees the end from the beginning." Around every abdominal segment of the chrysalis there are teeth or serrations in due order, which enable the chrysalis to secure a hold on the sides of its tunnel, to work its way up and to give it a purchase so that it can break through the closure of bark. It extrudes its body till the wing-cases are free, and then its skin is rent and the moth escapes.

Man learns by observation, experience and communication with his fellows, and provides against possible contingencies, but this creature, up to the time it leaves the chrysalis, has had no intercourse with its kind—has led a sol tary existence, pursuing the course marked out for it. It has been ignorant of its future. It could not of itself provide either against danger or change. But its course, its wants, the means for its security and comfort, its entrance upon a higher existence, all these on the dawn of creation—

"Hid in God's foreknowledge lay."

The Grand Architect of the universe made careful and exact provision for the creatures of His hand.

The science of entomology abounds in lessons. To the consideration of the lovers of beautiful objects, of the young, of pleasure-seekers; of gardeners, fruit-growers and farmers; of merchants, store-keepers and house-keepers; of physicians, pastors and teachers; of thoughtful and pious men and women everywhere, I commend it. *It is of importance to the community at large.*

The Chairman, Hon. J. Dryden, expressed the pleasure with which he, and he was sure all present, had listened to Dr. Fyles's interesting and instructive address. He then spoke of the powers of observation with which everyone is endowed, and impressed upon all the importance of cultivating this faculty to the utmost and obtaining the valuable results which would follow from doing so.

Dr. James Fletcher, of Ottawa, Dominion Entomologist and Botanist, was next called upon to address the meeting. He spoke of "The Value of Nature Study in Education," and held the close attention of the audience during his half hour's address, of which the following is a brief outline:—"Nature Study," he said, was a very simple matter, but one which was often misunderstood. It was not a study of natural history but a training to enable us to observe and understand, as far as possible, everything that comes before us. It teaches a child to notice the common objects about it and to see far more than it otherwise would. The addition of the study of natural objects to the school and college curriculum would exercise a very useful and important influence. True education is the drawing out of the faculties to enable the child, when grown up, to use its mental powers fully and properly; nature study does this and is therefore the common sense of education, for it teaches a child not only to see but also to think. He then described how bad boys in school may be improved. They are generally active and restless, wanting something to interest them and to use their faculties upon; but get them to join in investigating some of the lovely natural objects about them, no matter how common they may be, and a bond of sympathy with the teacher is at once created and their restless spirits find something to expend themselves upon.

Some of the benefits of Nature study are that it compels people to realize that everything in a state of nature is absolutely perfect and beautiful; it leads the student to become habitually neat and methodical in all his work; it promotes habits of care and accuracy; it insists upon

all observations being absolutely truthful ; it inculcates a spirit of reverence and tends to make better men and women. Not only in the æsthetic side, but also in the economic and practical side is its study valuable, for it must be of great use to know what insects are beneficial, and which injurious, and what plants are noxious weeds to be got rid of or useful for some special purpose. In Manitoba a practical instance of the value of Nature study can be found. There the children are taught in the schools to know the common weeds and plants of the country. In every school thirty of the commonest plants to be found on the neighbouring farms are brought in for study, and these necessarily include several weeds. The children are taught that there are three kinds of plants, those that live one year, two years or many years and that of the last kind there are two classes—the deep and the shallow rooted ; that plants, like animals, must eat and drink, and that they do so by means of their roots ; and therefore, that if the roots are exposed to the sun and wind they starve and die. The result already is that the most troublesome weeds are known and recognized throughout the length and breadth of the Province, and the farms are now much cleaner than they formerly were. Some such plan ought to be adopted here, and great benefits would, in a few years, result from it. The attention of our children should be directed, not only to plants but to birds, insects, wild animals, anything in a state of nature that may be found in their own neighbourhood.

Dr. Fletcher then spoke in warm terms of the great blessings we enjoyed in this Province, the excellence of our climate, the fertility of our soil, our freedom from devastating cyclones, the absence of serious epidemics, our admirable liberty with just laws to punish the evil doer, and then drew the moral that we should use every effort to train up our children to be worthy of such an inheritance, and to be fitted for the development and utilization of all our splendid resources.

He then delighted the audience by an exhibition of lantern slides of plants, insects, and other natural objects, respecting each of which he gave clear and concise explanations as they were thrown upon the screen. The following are some of the objects exhibited : Plant lice, canker worms, codling moth, scale insects, cabbage butterfly, spruce gall louse, horse bot-fly, sheep tick, luna moth, walking stick insects, pollen, leaf of deutzia, sections of pine, hollow and solid wheat stems, lilac buds and stems, and a stem of corn, yellow columbine, the sundew, Venus's fly-trap, etc.

A cordial vote of thanks was then moved by Mr. J. H. Bowman, seconded by Rev Dr. Bethune, to the Hon. J. Dryden for his kindness in presiding over the meeting ; to Dr Fyles and Dr. Fletcher for their interesting addresses, and to Principal Merchant for the use of the room, and his valuable services in providing the lantern, and with Mr. Rennie's assistance, manipulating the slides

The Hon. Mr. Dryden, in acknowledging the vote of thanks, said that he had been much benefitted by his visit. His Department and the Entomological Society went hand in hand for the country's good, and each recognized the value of the union ; he hoped that their mutual interest would never flag.

The meeting then adjourned.

Thursday, November 14th, 1901.

The Entomological Society resumed its sessions at 11 a.m., the President, Rev. Dr. Fyles, in the chair. The first order of business was the reading of the Director's Reports on the Insects of the year, which were followed by remarks and discussions participated in by several of the members. After the Report of the Council had been read, the meeting proceeded to the election of officers for the ensuing year, which resulted as shown on page 2. The reports of the various branches, sections, and officers were read and approved.

In the afternoon a number of valuable and interesting papers were presented, some of them from want of time being read by title only ; rare and beautiful specimens were exhibited ; many

notes and observations were recounted, and when the hour of parting arrived (about 5.30 p.m.) general regret was felt that the sessions could not be continued for another day. All who were present enjoyed the meetings very much, and realized how full of value as well as of pleasure such gatherings are, when men of similar tastes can meet and discuss subjects that to them are of exceeding interest.

The following exhibits were shown by Dr. Fletcher :—A case illustrating the method which had been adopted in the arrangement of the cabinets of injurious insects at Ottawa. Several of the more important injurious insects of the year were shown in all their stages together with some of their parasites.

In two cases mounted specimens were shown of rare or interesting species, amongst these may be mentioned two specimens of *Sphinx Canadensis* taken at Ottawa by Mr. Arthur Gibson. This species bear a somewhat close resemblance to *Sphinx chersis* but has a general tinge of brown over the whole body, as well as different ornamentation on the wings and thorax. *Sphinx Vancouverensis* from Rev. G. W. Taylor, collected at Gabriola Island, B.C.

Heterocampa binndata—a very large and handsome specimen, collected at Ottawa in the middle of June.

H. marthesia—a perfect specimen reared from a larva found at Ottawa in 1900.

Homohadena badistriga—in all stages.

Mamestra atlantica—in all stages.

M. adjuncta—moth and larva.

Datana integerrima—larvae and moths.

Arctia virgo—showing larva with dorsal stripe.

Arctia arge– larva, from D. Brainerd, Montreal.

Alypia MacCulloehii—moth and larva, collected at Banff, N. W. T.

Gluphisia severa—larvæ in all stages, and moths. Eggs received from Mr. J. W. Cockle, Kaslo, B. C.

Leucobrephos Middendorfi—2 perfect specimens received from Mr. Norman Criddle, of Aweme, Man.

Arctia phalerata—in all stages showing varieties, including females with yellow underwings.

Nemeophila Selwyni—bred from eggs collected at Nepigon, Ont.

Peridroma astricta—moths and the very beautiful larva reared from eggs sent from Kaslo, B. C., by Mr. J. W. Cockle.

Smerinthus ophthatmicus—in all stages from the egg to adult—reared from eggs sent by Mr. J. W. Cockle.

Arctia virgunculu—in all stages reared from eggs sent by Mr. A. Kwiat, of Chicago.

Several beautiful specimens of Hydroecias and their work were exhibited. The larvae of these were sent to the Division of Insects by Mr. Henry Bird of Rye, New York, and beautiful specimens for the cabinet were reared and exhibited of the following species : *H. cerussata*, *H. necopina*, *H. marginidens* and *H. impecuniosa*. *H. cataphraeta* was bred from Ottawa material, as well as *Achatodes zea* in considerable numbers, from the young stems of wild and cultivated elders (Sambucus).

The most interesting butterflies shown were *Erebia Vidleri*, from Mount Cheam, B.C.; *E. Rossii*, from Telon River, Y.T.; a specimen of *Pieris protodice* from Ottawa, and a very handsome specimen of the variety *Lintneri* of *Vanessa antiopa* in which the marginal band is $\frac{3}{8}$ of an inch wide at the widest part.

NOTES ON INSECTS OF THE YEAR.

DIVISION No. I.—OTTAWA DISTRICT.—By C. H. YOUNG, HURDMAN'S BRIDGE.

When Dr. Fletcher informed me on his return from the annual meeting of the Society in November of last year that I had been elected Director for the Ottawa district, I indeed felt greatly honoured at being appointed a member of the Council of such an important Society.

I regret however that owing to the remarkable absence, from a general standpoint, of all kinds of insects during the past season, that I was unable to make as many observations as I had hoped.

Tent caterpillars which had been so prevalent and destructive of late years in the Ottawa district were very scarce, and although I was on the look out for them, I failed to locate more than one nest—this on a wild plum tree.

The most abundant pest was the White Cabbage Butterfly (fig. 9), which occurred in remarkable numbers near my farm. In fact they were so prevalent at the end of June that they gave a decidedly white appearance to the fields when flying: as if a heavy fall of snow was in progress, or as if many people had torn up handfuls of small pieces of white paper and scattered them at the same time through the air. One of my neighbours had a great quantity of wild mustard growing in his fields, and the larvae were very abundant on these plants, and ate everything except the stems and flowers. They were, of course, very destructive to cabbages, and as soon as my neighbor set out his young plants the female butterflies immediately began to lay eggs on them, which in due course hatched, and the larvae quickly devoured the foliage. I advised my friend in time to dust his plants with pyrethrum insect powder, but as he considered that this was too expensive an operation he did not do anything and as a result lost all his plants. In August the larvae of the later brood were also very prevalent on turnips. I examined numbers of plants and was pleased to notice that a bacterial disease was at work among the larvae, most of them were dead and in a putrid condition.

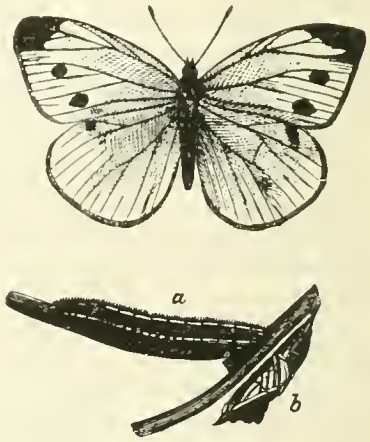


Fig. 9. White cabbage butterfly—*a*, larva; *b*, chrysalis.

Fig. 10. Canker-worm—*a*, male moth; *b*, female.

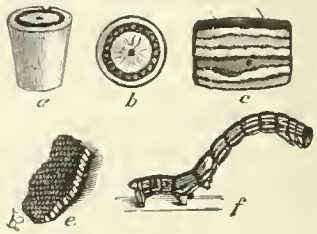


Fig. 11. Canker-worm, eggs and larva.

In the spring of the year Canker-worm larvae (*Anisopteryx pometaria*) (figs. 10 and 11) were very abundant, especially on forest trees. Basswood and beech seemed to suffer most as far as I observed.

From about the middle of August until the early part of September Birch trees of all kinds were badly attacked by the larvae of the Birch Bucculatrix (*Bucculatrix Canadensisella.*) (Fig. 12 shows an allied species which attacks apple-trees.) This attack caused widespread attention and as the larvae were so abundant they soon stripped the trees of their foliage. Towards the end of August the attack was most noticeable, and at this time the leaves were quickly falling from the trees.

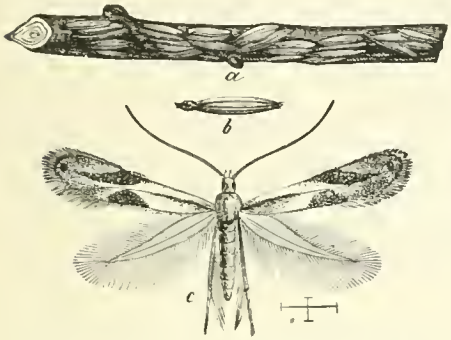


Fig. 12. The apple Bucculatrix (*B. pomifoliella*) —*a*, cocoons on a twig; *b*, a single cocoon; *c*, the moth, greatly magnified.

From the collector's standpoint insects were very scarce in this district during the past season. I, therefore, did not succeed in taking many species which call for special mention. I have during the year continued my work at breeding and inflating larvæ, and the following, which are shown in a case I have brought to the meeting, are some of the species I have raised or collected the larvæ of: —

Papilio turnus—larva, chrysalis and imago; common.

Fig. 13. Philampelus achemon—moth.

Grapta comma—dark and light forms of larva, chrysalis and imagoes. Larvæ were rather common this year on hop.

Philampelus achemon—larva (fig. 14), pupa and imago (fig. 13). This year I collected about 11 larvae on wild Virginian Creeper.

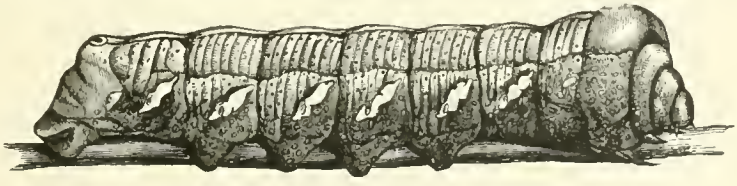


Fig. 14. Philampelus achemon—larva.

Deilephila chamænerii—larva, pupa and imago. Larvae bred from eggs.

Ampelophaga myron—larva, pupa and imago—Larvae uncommon at Ottawa as a rule.

Euprepia caja, var. *Americana*—larva and imago—species rather rare at Ottawa.

Arctia arge—larva and imago—very rare at Ottawa.

Orgyia leucostigma—larva and imago—bred from eggs collected at Toronto.

Parorgyia Clintonii—larva and imago—uncommon at Ottawa.

Euchaetes egle—larva and imago—larvae sometimes abundant on Asclepias.

Semiophora Youngii, Sm. This is a very beautiful Agrotid, the moths of which have been taken on the Mer Bleue, an extensive peat bog near Ottawa, during the past two seasons, and of which several specimens of the larvae were taken nearly full grown at the end of May, 1901, feeding on spruce and American Larch. Larvæ, pupae and imagoes. For a description of this new species see "Canadian Entomologist," vol. xxxiv, page 29, (February 1902).

Arsilonche albovenosa—larva, pupa, imago and parasites. Larvæ common at Ottawa.

Noctua bicarnea—larva and imago—common.

Noctua baja—larva and imago—common.

Noctua clandestina—larva and imago—common.

Mamestra lorea—larva and imago—larvæ common in spring under bark, etc. on the ground.

Hyppa xylinoides—larva and imago—rather common.

Homohadena badistriga—larva and imago—larvæ found on wild honeysuckle.

Abrostola urentis—larva and imago—larvae collected on nettle.

Alaria florida—larva and imago—larvæ occasionally abundant in seed pods of Common Evening Primrose.

Nomophila noctuella—larva and imago—common.

Balsa malana—larva and imago—larvæ on apple.

Division No. 2.—Bay of Quinte.—By J. D. Evans, Trenton.

During the past season very few cases of depredations by insects have come to the writer's notice. *Clisiocampa disstria*, which have been so very destructive in the recent past, were not observable this year, or were so few in numbers as to cause little serious injury.

The only noteworthy instance of a serious attack was that of *Lecanium Fitchi*, the bark louse, on the long blackberry ; they were first observed on the 14th of June. On the 20th, six days following, samples of the canes were brought to the writer by Mr. W. A. Warner ; he stated that he had half an acre of these berries, and his neighbours, a Mr. Arnott had about six acres and a Mr. Higgins 2 acres ; these gardens are situated about two or three miles to the north west of the Town of Trenton. The canes, he said, were literally covered with these insects from a height of twelve or eighteen inches above the ground to the top ; in one instance upwards of 150 were crowded within a space of seven inches on the stem. Bordeaux mixture and whale-oil soap emulsion had been applied but apparently with very little beneficial result. Upon making further enquiries and a personal inspection it was learned that Mr. Arnott was the principal sufferer, the others having very few, if any, of the unwelcome visitors. Several samples of these infested canes were forwarded to Dr. Fletcher of the Central Experimental Farm.

Upon examination with a lens it was seen that the majority of the shells, or cases, were filled with an immense number of eggs of a whitish color, and a few of the cases were tenanted with the larvæ of some insect. At this time the fruit was forming but before it ripened, the canes were swarming with the newly-hatched young, they however vanished without doing any appreciably serious injury to the fruit. After the fruit had been gathered the majority of the old canes were cut down and destroyed by fire ; in a small patch near the dwelling house, however, the old canes had not been cut down and when on the sixth of the present month, (November,) the writer again visited this garden the new canes were found to be infested, but to a much less degree than the past season's bearing canes.

In June last, the writer placed two of the infested stems in a glass jar, covered with muslin, and awaited developments. About the 1st of July, the eggs began to hatch out and the young

appeared in great numbers, about the same time there also appeared three species of Chalcis flies, the larger species appeared first and numbered fifteen specimens in all ; then followed two other species much smaller in size of which there were forty-five specimens of one, and twenty-three of the other. No more of them making their appearance, after a few days, the jar was put to one side and overlooked for a time ; however, on the 11th of August, other prisoners were observed the majority of them being dead but in two or three instances they were alive ; these proved to be *Hyperaspis* four males and seven females of *proba* and one female of *signata*.

When examining the canes on the sixth inst. in Mr. Arnott's garden, it was noticed that some of them presented a peculiar appearance from the ground upwards, as if they were covered with a white fungus, upon close inspection they were seen to be scale insects of a species unknown to the writer, samples of which are herewith presented.

Since presenting the foregoing report Dr. Fletcher has very kindly obtained the names of the parasites, etc.

The small white scale above referred to, found on the blackberry, is the Rose scale (*Aulacaspis rosæ*, Bouché, sometimes called *Diaspis rosæ*). Dr. Fletcher remarks that this is a very bad pest.

The parasitic flies have been identified at Washington, D.C., as follows : No. 1, *Encyrtus (Comys) fuscus*, How. No. 2, *Aphycus annulipes*, Ashm. No. 3, *Blastothrix* sp.

The following additional species were obtained from the blackberry canes sent from Trenton to Ottawa. No. 4, *Microterys*, sp. male. No. 5, *Coccophagus flavoscutellum*, Ashm. No. 7, *Eustochus xanthothorax*, Ashm. Dr. Fletcher says of this last, "a Mymarid described 15 years ago in Can. Ent. vol. 19, 1887, p. 193. This is an exceedingly minute creature which Mr. Guignard found in sorting out the material" and as reported by Mr. Ashmead, "it is the second specimen seen."

The fungus found infesting the Lecanium Prof. Roland Thaxter says "is evidently an immature *Cordiceps* of some sort, I thought at first *C. clavulata*, but the conidia are not those of that species."

Division No. 4.—Hamilton District.—By James Johnston, Bartonville.

We have had two very troublesome insects in this district this season, the Hessian fly (*Cecidomyia destructor* Say.) and the potato beetle (*Doryphora 10-lineata* Say).

The work of the Hessian fly was so great as to entirely ruin whole fields of wheat. I have seen fields that looked well and promising last fall and in the early spring so badly ruined as to render them not worthy of being harvested. The early sown fields were where the flies seemed to work the most destruction. The folks on this farm were so discouraged that they have sown rye instead of wheat this fall as a means of checking them.

About the beginning of June the general complaint was about the ravages of the potato beetles amongst the tomato plants. During my experience this has been a record year for these pests. One morning in early June four of us started to put out tomato plants where no beetles were to be seen, but after dinner they were so numerous on the plants set out that we had to leave off planting and turn to hand-picking the beetles. We found from one to thirty-seven on individual plants, so that an idea can be formed of our task of going over 18,000 plants, a task that had to be repeated for several days. If they would show themselves our work would not be so extensive, but the plagued things hide themselves away under lumps of earth when not feeding, so that it is necessary to be daily on the lookout for them.

The following are the only insects new to this district that I have to report for this year :—

As early as February a specimen of *Anthrenus scrophulariae*, Linn., was brought to me from a neighbor's house and later on I came across several.

Sept 28th *Crioceris asparagi*, Linn., (Fig. 15) made its first appearance on our asparagus, when I secured six specimens.

Oct. 10th I took a fine fresh specimen of *Pyrgus tessellata*, Scud. (Fig. 16). Saw another the week previous but failed to secure it.

In the discussion which followed upon the reading of the Directors reports, Dr. Fletcher referred to the little black Lady-beetle, *Pentilia misella*, in Canadian orchards, and said that while it is an object of great interest from its habit of preying upon the San José scale, it cannot be relied upon as of any great value for the destruction of the scale. It is still absolutely necessary to apply practical remedies and not wait for this little insect to perform the work.

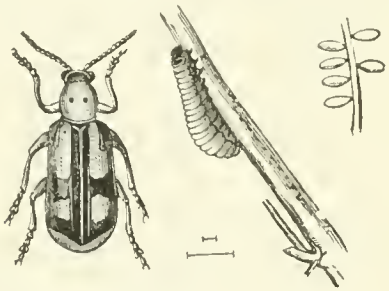


Fig. 15. Asparagus beetle, larva and eggs.

Fig. 16. Pyrgus tessellata.

Prof. Webster said that the *Pentilia* was increasing in abundance in Ohio, but only late in the fall did it become numerous ; the winter following reduced its numbers to such an extent that it took all the next season for it to recover its numbers, and consequently it was not of much help as a remedy for the scale. The Colorado potato beetle had been very bad on tomatoes in Ohio this year

Dr. Fletcher said that it had also attacked tobacco grown in gardens at Ottawa. In speaking of the cabbage butterfly he recommended the Pyrethrum insect powder as the best means for destroying the larvæ ; it would be much too dangerous to apply Paris green to a vegetable that was afterwards to be brought to table.

REPORT OF THE COUNCIL.

The Council of the Entomological Society of Ontario begs to present its Annual Report for the year 1900 1901.

The thirty-seventh annual meeting was held in London in November, 1900, and was well attended both by resident members and those from a distance. On the first evening a joint meeting was held with the Horticultural Society in a lecture room at the Normal School. The chair was taken by Prof. C. C. James, Deputy Minister of Agriculture for Ontario, who delivered an interesting address on the value of horticulture in its various aspects and its intimate relation with Entomology. Mr. W. E. Saunders followed with a paper on "The planting, care and pruning of the trees in the parks and streets of the city," and Dr. James Fletcher gave an address, illustrated with lantern pictures, on trees and their methods of growth and on some especially injurious insects. The two following days were occupied with the reading of papers and reports, a discussion on the San José scale and the transaction of the business of the Society. A full account of the proceedings has been published and distributed.

The thirty-first Annual Report on Economic and General Entomology was presented to the Minister of Agriculture for Ontario in December last and was issued from the press in the following February. It contained 112 pages and was illustrated with forty-six figures in the text and a photogravure portrait of Mr. J. Alston Moffat, who has been the efficient curator and librarian of the Society for upwards of ten years. In addition to an account of the proceed-

ings at the annual meeting, it included among many useful and practical papers the President's address by the Rev. Dr. Fyles, in which he described the importance of insects in the fertilization of plants ; papers by Prof. F. M. Webster on the codling-moth, the use of crude petroleum against scale insects, some species of Dermestidæ and two longicorn beetles affecting nursery stock ; by Prof. W. Lochhead on forest insects, the San José scale, the squash bug, and the silk industry in Ontario ; by Mr. Moffat on Anosia Archippus and Parasites in the eggs of Chrysopa ; by Dr. Fyles on the Dragon flies of Quebec ; by Dr. Fletcher on the injurious insects of 1900 in Ontario ; notes on insects of the year by the Directors, Messrs. Evans, Cox, Johnston and Rennie, and by Mr. Moffat ; and papers by Messrs. Gibson, Gregson, Nash and Dearness. An abstract was given of the proceedings at the annual meeting of the Association of Economic Entomologists, and a short report of the second annual meeting of the North-west (Canada) Entomological Society.

The *Canadian Entomologist* has been regularly issued at the beginning of each month. The 32nd volume was completed in December last ; it consisted of 387 pages, illustrated with thirty-three figures from original drawings and seven full-page plates. The contributors numbered sixty-four and included well-known Entomologists in Great Britain, Germany, Switzerland, South Africa, Brazil and Mexico, as well as in the United States and Canada. The 33rd volume will be completed next month ; the eleven numbers thus far issued contain 316 pages and several original illustrations.

The Index to the thirty annual Reports of the Society, 1870 to 1899, was published in January last, and is for sale at a nominal price. To those who have occasion to refer to the Reports it must be of very great value.

Meetings for the study of Entomology were held during the winter, the order Coleoptera being taken as the portion for consideration. The Geological and Ornithological Sections have held regular meetings throughout the year, the Microscopical Section during the winter months, after which the Botanical Section took its place. Public lectures of a popular character were given by Dr. Bethune on Entomological subjects before the London Horticultural Society, the Canadian Horticultural Association, and the Young People's Societies connected with the Bishop Cronyn Memorial Church and the South Wellington Street Methodist Church. Mr. W. E. Saunders also delivered lectures on the Birds of Canada, illustrated with lantern pictures, at the High School, Montreal, and before several teachers' meetings and church societies. One field meeting was held at Komoka on the 13th of July, and a goodly number of botanical and entomological specimens were obtained.

The Council desires to place on record its high appreciation of the services of Mr. J. A. Balkwill, who has filled the office of honorary treasurer for the last nine years and has now found himself unable to continue in the position. His books have been kept with great neatness and accuracy, and his attention to the business of the Society has always been prompt and satisfactory. Thanks are also due to Mr. Moffat, the Curator and Librarian, who has been indefatigable in his care of the library and collections, and has shown a constant zeal and interest in the welfare of the Society.

The Council here places on record its great appreciation of the scholarly and valuable work of the Editor of *The Canadian Entomologist*, the Rev. Dr. Bethune, who during the last thirty-eight years has been doing useful service for the advancement of entomology, not only in Canada but throughout North America.

The Council, in common with entomologists everywhere, deeply deplores the loss of Miss Eleanor A. Ormerod, one of our honorary members, who died on the 11th of May last. Her work in economic entomology has proved most valuable to husbandmen, gardeners and others in Great Britain and of much interest to scientific students in all lands.

All of which is respectfully submitted.

THOMAS W. FYLES, President.

REPORT OF THE MONTREAL BRANCH.

The 232nd regular and 28th annual meeting of the Montreal Branch of the Entomological Society of Ontario was held at the residence of Mr. A. F. Winn, 58 Bruce avenue, Westmount, on the 14th of May, at 8.30 p.m. The members present comprised Messrs. A. F. Winn (President), Dwight Brainerd, G. Chagnon, M. W. Davis, J. B. A. L. Leymarie, Henry H. Lyman, G. A. Moore, A. E. Norris, C. Stevenson, and L. Gibb.

The chair was taken by the President, and the minutes of the previous meeting and the last annual meeting were read and confirmed.

The President then submitted the following report of the Council for the past year :—

Your Council have pleasure in presenting the following report of the Society's work during the season 1900-1901 :

Eight regular monthly meetings have been held, the average attendance being ten.

A field day was held at St. Hilaire, on May 24th, which was a very successful and enjoyable outing.

The following papers were read at the meetings :—

Life History of *Euchates Oregonensis*... ..... Henry H. Lyman.
Note on the Emergence of a Gall Insect..... .....A. F. Winn.
Notes on the Past Season (1900).....A. E. Norris.
Methods of collecting Lepidoptera.....H. H. Newcomb.
Notes on Walker's Types of *Spilosoma congrua* ....H. H. Lyman.
Danais Archippus ....J. B. Williams.
A Fortnight at Biddeford, Maine ....A. F. Winn.
Ephestia Kuhniella..... ....Dwight Brainerd.
Notes on Hybridity of Lepidoptera, Papers by Miss Morton, Newburgh, N.J., and H. H. Newcomb Boston, read by the President.
Notes on the Larvæ of *Scopelosoma Morrisoni S. tristigmata*, and
Description of the Larvæ of *S. Graefiana*.....H. H. Lyman.
Entomological Chemistry.....C. Stevenson.
Life History of *Vanessa Antiopa* ....A. E. Norris.
Commercial Entomology ....C. Stevenson.
A Query Regarding the Death of Insects.....A. F. Winn.
Pardisca Scudderiana ....Dwight Brainerd.
Notes on *D. archippus* .....H. H. Lyman.
Among the Lycænæ in England .....L. Gibb.

Two new members, Messrs. J. B. A. L. Leymarie and E. Denny, have been added to our roll, but we have also lost, through the sudden death of Mr. E. T. Chambers, one of our most regular attendants at the meetings. Mr. I. B. Williams has moved to Toronto where he will, doubtless, join the Toronto branch. Dr. Wyatt Johnston and H. N. Cowan have resigned.

The book-case ordered for us is in place in the library of the Natural History Society : the few books in it will form a nucleus for a future collection of literature on our favourite subject.

The subject of the formation of a general collection of insects for our Branch was given a good deal of time and attention, and it was unanimously decided to make a beginning. A dozen drawers and a case of sufficient size to contain thirty have been ordered, and we hoped to have had the cabinet ready for donations before to-night's meeting ; such would have been the case but for the death of Mr. Priddy of Toronto, who had the order.

The work on this case is being completed and word of its shipment is expected any day. The members are especially requested to do their best to make the collection as perfect and

useful as possible. Through the kindness of Miss Morton we have already received a fine collection of Hybrid Attaci.

The report of the Treasurer submitted herewith shows that we still have a considerable balance to our credit.

Respectfully submitted on behalf of the Council.

(Signed) A. F. Winn,
President.

The Librarian then made his report, and it was moved by Mr. Charles Stevenson, seconded by Mr. G. A. Moore, that the reports of the Council, Treasurer, and Librarian, be received and adopted. Carried.

The Treasurer submitted his report, shewing a balance on hand of $48.90.

The President then read his annual address.

The following officers were elected for the ensuing year;—

President.....G. Chagnon.
Vice-President.....C. Stevenson.
Librarian and Curator.....A E. Norris.
Treasurer and Secretary.....G. A. Moore.
Council.....Henry H. Lyman.
A. F. Winn.
Dwight Brainerd.

Moved by Mr. A. E. Norris, seconded by Mr. C. Stevenson, that a regular meeting be held in June this year.

Moved by Mr. G. A. Moore, seconded by Mr. J. B. A. L. Leymarie, that a field day be held at Belœil on the 24th inst. Carried.

Mr. A. F. Winn moved, seconded by Mr. M. W. Davis, that a committee on outings for the summer be formed to consist of Messrs. G. Chagnon, C. Stevenson, and A. F. Winn. Carried.

Mr. L Gibb exhibited a number of Lepidoptera collected in the Yukon in the season of 1900.

After the examination of specimens and discussion, the meeting adjourned.

G. A. Moore,
Secretary.

REPORT OF THE QUEBEC BRANCH.

At an adjourned meeting held at "Darnoc," the residence of James Geggie, Esq., on the 22nd June, 1901, the President gave an address, the Report of the Council was made, and the officers for the current year were chosen, as follows:

President's Address.

We have now entered upon the fifth year of our Association as a branch of the Entomological Society of Ontario.

Since the formation of the Branch we have had many happy gatherings in which conversations have been held and papers read upon the subject of animal and vegetable life and upon the beauties and wonders displayed in the natural objects around us. We have, moreover, enjoyed much social intercourse and many delightful visits to places of interest in the neighborhood of Quebec. Not a few choice specimens of natural objects have been taken by our collectors.

It is hoped that the season we have now entered upon will be as fruitful in pleasant associations as those that have gone before, and that our Branch will continue to flourish.

Among the subjects that during the past year have engaged the attention of practical entomologists have been :—

1. The increased destructiveness of, and the preventives against, that most injurious creature, the San José scale. Professor Lochhead, of the Ontario Agricultural College, has issued a valuable paper upon this pest.

2. Much thought and ability have been brought to bear by Dr. Howard, of Washington, upon the mosquitoes and the danger that exists of the conveyance of disease by them from fever patients to healthy persons. The subject is one of very grave importance.

3. The subject of the Green Pea Aphis was brought under the notice of the members of the Entomological Association at its last annual meeting by Dr. Fletcher. The Green Pea Aphis is a pest that is doing much damage to the pea crops. It has been found destructive along the Atlantic coast, in some of the Western States and in parts of Canada. Several references to it are to be found in the Society's last annual report and will be found interesting.

4. The question as to the practicability of the cultivation of silk in this country has been considered. Professor Lochhead has looked carefully into the subject and has come to the conclusion that, although the climate of Ontario is suitable for silk-culture, and the Osage-Orange, a fitting food-plant for the silk-worm, can be freely grown, there is one great preventive to the introduction of the industry, viz., the lack of cheap labour. This is such that it is thought our people could not compete with the foreign growers.

I think the subject shou'd not be allowed to drop but should be further looked into, for, during the fiscal year, ended June 30th, 1899, silk and silken goods to the value of $3,752,539, were imported into Canada, and upon them duty amounting to $1,091,218.49 was paid.

It may be interesting to learn that our Quebec people indulged in silk handkerchiefs during the year to the value of $24,489 and in silk hosiery to the value of $1,174. In this respect they exceeded the Ontario people who only expended $939 ; but they fell short of the people of British Columbia who laid out $1,875 in silken foot-wear.

In sewing and embroidery silk, Quebec expended $8,700, more than one-half the expenditure of the whole Dominion, which speaks well for the industry of its ladies in certain directions.

An important work well done has been issued by the society, viz :—a "General Index to the Thirty Annual Reports of the Entomological Society of Ontario, 1870-1899, prepared by Rev. C. J. S. Bethune, D. C. L., Editor of the *Canadian Entomologist*". The cost of this useful compilation to members is 25 cents per copy unbound and 50 cents bound in cloth.

Our branch has suffered from the loss by death and removal of some of its members. It is hoped that new additions will keep up our numbers.

Report of Council.

The branch now includes 42 members (33 adults and 9 juniors).

The Treasurer's Report is submitted and will no doubt be found satisfactory.

The continued rainy weather of last summer prevented the members from having many field-days but two very enjoyable ones were held on the 16th June and 14th July.

Our thanks are due to the authorities of Morrin College for having continued to allow us the use of their rooms for our meetings.

Crawford Lindsay,
Secretary-Treasurer.

The following were elected officers :—President— Rev. Dr. Fyles, Vice-President—Miss E. MacDonald, Council—Hon. R. Turner, Mrs. R. Turner, Mr. J. H. Simmons, Miss Bickell, Miss Winfield, Mr. James Geggie.

Lt. Col. Crawford Lindsay,
Secretary-Treasurer.

REPORT OF THE TORONTO BRANCH.

The fifth annual meeting of the Toronto Branch of the Entomological Society of Ontario was held in the Edueation Department Building, on Friday evening, May the 10th, 1901.

Present; Messrs. Cox, Webb, Williams, Smith, Rossiter and Stewart. The President, Mr. D. G. Cox, in the chair. The minutes of the previous meeting were read and approved. The Secretary read the following Report of the Council.

The Council of the Toronto Branch of the Entomologieal Society of Ontario take pleasure in presenting the fifth Annual Report of the proceedings of the Branch for the year ending 30th March, 1901.

They are pleased to report that since the last annual meeting six new members have been admitted. As an offset to this four members have withdrawn.

During the year eight regular meetings have been held in the Education Department. At three of these papers have been read, viz :—

"On the Inflation of Larvae"..... .....Arthur Gibson.
"The Colours of Inseets"..... .....G. M. Stewart.
"Aquatie Insects"..... .....E .M. Walker.

It is hoped that more papers will be presented by the members during the coming year. Much discussion has been held on entomological matters, and a number of specimens have been exhibited.

A large part of the time of the meeting has been devoted to the collection of insects, which the Branch is preparing for the Ontario Education Department, and some headway has been made. The Orthoptera, the Coleoptera, and the Diurnals among the Lepidoptera have been classified. Many donations of specimens have been received for the collection, notably some Haitian Lepidoptera from Mr. Cox, and it is hoped that the members will collect for it as largely as possible during the coming season.

Many valuable papers have been received from various sources, notably the Cent. Exp. Farm, Ottawa, the Ohio Agricultural Experiment Station, the New York Agricultural Experiment Station, the United States Division of Entomology, the Cornell University Insectary, and the Chicago Entomological Society.

The Society also subscribes for the "Journal of the New York Entomological Soeiety," and for the "Entomologieal News."

The Treasurer's report shows a small balance carried forward on the right side.

Respectfully submitted on behalf of the Council,

D. G. Cox,
President.

Mr. Cox then addressed the meeting, speaking of the work of the Society, and the means by which this work might be improved in the future.

The election of officers for the ensuing year resulted as follows :—

President..... ....Mr. D. G. Cox.
Vice-President ....Mr. E. M. Walker.
Secretary-Treasurer. ....Mr. J. B. Williams.
Librarian and Curator..... .....Mr. Geo. Rossitor,
Members of Council..... ..... { Mr. J. H. Webb.
.... { Mr. Arthur Gibson.

Mr. Cox asked for the opinion of members as to the admission of foreign specimens into the collection of insects. All the members were of the opinion that foreign specimens should be included, as they were included in the other branches of the museum.

It was decided to hold a Field Day in High Park on the 24th of May. The meeting then adjourned.

G. M. Stewart, Secretary.

REPORT OF THE LIBRARIAN AND CURATOR.

For the Year Ending 31st of August, 1901.

Thirteen bound volumes were received from Governments, Societies and Scientific Institutions during the year.

Two were obtained by purchase, one of which is the Century Atlas of the World.

One was presented to the Society by the Rev. Dr. Bethune, making sixteen bound volumes altogether.

Fifteen volumes were bound and placed on the shelves, making a total of thirty-one volumes added to the Library during the year.

The full number of volumes now on the register is 1,722.

Thirty-three volumes were issued to local members during the year.

There have been few additions made to the native collection during the past season, and nothing of special importance has been reported as having been taken in this locality.

An important addition was made to the exotics by the receipt of a collection of Japanese beetles; many of them being large and attractive specimens. A small collection of West African insects was presented to the Society by Mr. T. H. Hill, who has recently returned from that region, where he was engaged in missionary work for about seven years.

Respectfully submitted,

J. Alston Moffat.

AUDITORS' REPORT FOR THE YEAR ENDING AUGUST 31st, 1901.

Receipts.		Expenditure.	
Balance on hand, September 1st, 1900	$492 71	Paid for pins, cork, etc.	$60 03
Sales of pins, cork, etc.	72 12	Expense account (postage, etc.)	139 14
Advertising	31 85	Printing account	717 55
Sales of Entomologist	151 97	Annual meeting and report	163 28
Government grant	1,000 00	Library account	42 09
Members' fees	395 04	Salary account	375 00
Interest	11 51	Rent	175 00
		Balance, August 31st, 1901	483 05
	$2,155 20		$2,155 20

We, the Auditors of the Ontario Entomological Society, have examined the books of the Treasurer, compared them with vouchers and find them correct, and certify that the above is a true statement.

James H. Bowman,
W. H. Hamilton, } Auditors.

REPORT OF THE MICROSCOPICAL SECTION.

The Microscopical Section of the Entomological Society of Ontario beg leave to present their annual report as follows:—A meeting for the purpose of re-organizing was held on February 22nd, 1901, when the following officers were elected:

Chairman.....Dr. Bethune.
Secretary.....E. A. Brown.
Committee.....John Dearness.
J. A. Bowman.
R. W. Rennie.

On account of the lateness of re-organizing, only four meetings were held, with an average attendance of eight, as well as visitors.

During the season four papers were read –

(1) Microscopical Examination of Crystals.....J. H. Bowman.
(2) Microscopical Examination of Bacteria.....R. W. Rennie.
(3) Dermestes.....J. Dearness.
(4) Pond Life.....J. H. Bowman.

Besides these short notes on interesting subjects were read, and many very interesting slides of microscopic plants, crystals and insects were examined.

The Section gave an entertainment by request in the school-room of the Bishop Cronyn Memorial Church; an address on "Mosquitoes and Malaria" was given by Dr. Bethune, followed by an exhibition of microscopical objects by Messrs. Bowman and Brown; the attendance was large and all were greatly interested.

CHARLES J. S. BETHUNE, Chairman.
EDGAR A. BROWN, Secretary.

REPORT OF THE BOTANICAL SECTION.

The re-organization meeting of the Botanical Section of the Entomological Society of Ontario was held on May 4th, 1901, when the following officers were elected :–

Chairman.....R. W. Rennie.
Vice-Chairman.....Dr. C. J. S. Bethune.
Secretary.....E. A. Brown.

Eight meetings were held during the summer, commencing May 11th, and every alternate Saturday evening thereafter, with an average attendance of seven, besides visitors. A very pleasant and profitable field-day was spent at Komoka on July 13th. At each meeting interesting subjects were discussed, and objects of interest reported. Six papers were read, viz. :—

(1) The Study of Botany with the Camera.....R. W. Rennie.
(2) A Trip to Sable Island.....W. E. Saunders.
(3) Pond-net (Hydrodicton Utriculatum).....J. H. Bowman.
(4) Collecting Native Orchids.....Dr. C. J. S. Bethune.
(5) Hydra.....J. H. Bowman.
(6) Fungi.....John Dearness.

R. W. RENNIE, Chairman.
EDGAR A. BROWN, Secretary.

REPORT OF THE ORNITHOLOGICAL SECTION.

The year has been marked by a vigorous prosecution of Ornithological work, though not by any growth in the membership. Two regular meetings were missed on account of uncontrollable circumstances, and one extra meeting was held in July. At the nine meetings held a total of thirty-two members were present, averaging less than four to each meeting.

Three of these meetings were spent informally in the examination of the collections of Messrs. Keays, Gould and Saunders, and at the remaining six meetings ten papers were read as well as a number of shorter notes on interesting subjects. The papers read were as follows :

"The Acadian Owl in Captivity," F. Norman Beattie, Guelph.

"Concerning Woodpeckers," Robert Elliott, Bryanston.

"The Birds of Algoma," Rev. C. T. Scott, London.

"The Extinction of the Elk," and "The Woodcock's Love Song," L. H. Smith, Strathroy.

"The Buff-breasted Sandpiper," Dr. G. A. McCallum, Dunnville.

"Humming Birds," "The Grasshopper Sparrow," and "Notes on Sable Island," illustrated by skins and the very rare nest and eggs of the Ipswich Sparrow, as well as other birds, photographs and curios from the Island, W. E. Saunders, London.

"The Habits of the Saw-whet Owl," Wm. H. Moore.

Five of these papers have appeared in the *Ottawa Naturalist*, one in *Forest and Stream* and the remaining four will probably come out in the *Naturalist*.

Three new birds have been recorded for the county in which the members of the section reside, namely: The Glaucous Gull, the Golden Eagle and the King Eider Duck. Short notes on each were written, and two of these have already been published in the *Ottawa Naturalist*, and the two former specimens were exhibited at the Section's meetings.

The migration lists for the year have been compiled, shewing a large number of species noted in their migrations by members.

A list of the birds of Middlesex County is in course of preparation and may be completed during the coming year.

The Opossum, a mammal not recorded in recent years in Ontario, has been noted in two places, one specimen having been taken near Port Colborne, and two at Rond Eau. The occurrences have been duly noted at the meetings.

Mr. Robert Elliott has identified a skull of a local skunk as *Chincha pulida*, the Eastern skunk. The official skunk for northern Ontario from Nipissing to Rainy River is the Canada skunk, *Chincha mephitis*, which we have yet to find.

Interesting discussions have, of course, taken place on many subjects recorded on the minutes but not referred to in this report.

During the past year addresses and demonstrations have been given on Ornithological subjects to teachers and other assemblies by members of the Section as follows: By Mr. W. E. Saunders to the Teachers' Association meeting at Easter; the Boys' Club of St. James's Presbyterian Church; the Epworth League of the Wellington Street Methodist Church; a farmers' meeting at Derwent, Ont.; a lecture, illustrated with lantern slides, on the Birds of Canada, at the High School, Montreal, under the auspices of McGill College; the same lecture was repeated in London at the First Methodist Church, the First Baptist Church and to the Epworth League of the Dundas Centre Methodist Church. By Mr. H. Gould to the teachers of the Lorne Avenue Public School and to the Kindergarten, Lorne Avenue, London.

J. E. Keays, Chairman.
W. E. Saunders, Secretary.

REPORT OF THE GEOLOGICAL SECTION.

The Geological Section of the Entomological Society of Ontario begs leave to present its annual report

Meetings were held weekly throughout the year, excepting the usual summer vacation. Geological studies were actively prosecuted and field work was done in several localities in the south western peninsula. Amongst other places visited were Grand River Valley, near Galt; 2, Sydenham Valley at Alvinston; 3, Corniferous and Hamilton formations in Bosanquet. The specimens obtained were placed upon the table and after study went to increase the various collections of the members os the Society.

The Chairman of the Section made interesting reports upon his trips to the locations above named. For the first time the Corniferous strata has been made a special study, being fully exposed by operations having in view the drainage of lands adjacent to Mud Creek, which empties into the Sauble, near Port Frank. Fine specimens of Orthoceras from two to three feet in length were found, many being broken by explosives used in blasting away the rock. A very perfect specimen, one foot long, was shown to the class. Spirifers of larger size (Spirifer striatus) were found very abundantly in beds of clay above this formation, also a number of other fossils, Murchisonia being the chief.

Because of the great excess of silica the use of the rock is very much restricted, being too hard and too fragile and also containing iron, which makes it un-suitable for building purposes. This is in decided contrast to the formation exposed at St. Mary's, where the Corniferous is remarkably free from silica and contains an abundance of fossils of the Devonian Period and occasionally the remains of fossil fishes are found.

The Hamilton formation immediately overlies the Corniferous at Arkona, where it is exposed by the Sauble River. This vicinity is well known as one of the finest collecting grounds in the world. Many distinguished scientists have visited the Sauble Valley, amongst others Prof. Hall, New York ; Prof. Winchell, Ann Arbor, and many others Geologists of lesser note. Here trilobites abound, the characteristic species being Phacops Bufo. Fossil corals, also of great beauty and variety, completely silicified, are found here and Crinoids in vast abundance.

In visiting this section a geologist may leave his hammer at home and come provided only with baskets or an express wagon which he would have no difficulty in filling with these ancient fossil remains. Specimens from this district have been shipped to many museums in Great Britain and United States. The Academy of Natural Science in Philadelphia was this year presented with a small collection of local specimens by the Chairman of the Section who thus advertises Ontario in an efficient way. When our city sees fit to establish a museum we have at our doors a rich field in which to secure a very varied collection suitable for studying the Paleontology of this district and which also may be used for exchanges.

After being Chairman of the Geological Section since its inception, excepting one year when Professor Andras occupied it, Dr. Woolverton has now resigned in favor of Mr. Kirk, a capable and energetic member of our section.

The following reports will be placed in the hands of the Editor :

Roads and Road-making ..... Mr. Kirk.
The Galt Dolomites ..... Mr. Goodburne.
Methods of Concentrating Gold ..... Mr. J. G. Smith.
The Mastodon of Mount Brydges ..... Mr. J. G. Smith.

[The report on "Roads and Road-making" has already been published elsewhere.]

The Galt Dolomites.

Limestone is perhaps one of the most abundant of all minerals, and the most widely distributed, quartz alone excepted. It appears in very many different forms, the ordinary one of limestone being best known, with marble as the most valuable, and these two show the extremes of the substance—one the original material and the other the metamorphic condition. Limestone is composed of carbonic acid, 44 ; lime, 56 ; but carbonate of iron or magnesia may take the place of a portion of the carbonate of lime. A very large amount of our limestones, however, are properly dolomites, which differ from the limestone in the process of deposition, and in chemical structure. Dolomite consists of carbonate of lime, 54.35 ; carbonate of magnesia, 45 65 ; these including a small portion of protoxide of iron (FeO) or magnesia. Dolomites are calcareous, and appear to have been simple chemical precipitates, and in some cases to have originated from the alteration of limestone rocks by magnesia salts.

Water containing free carbonic acid (derived from decaying vegetable matter) dissolves a portion of carbonate of lime, but the bicarbonate thus formed is easily decomposed, even by mere exposure to the atmosphere and a precipitation of calcareous matter takes place. In this manner the calcareous tufas of our swamps, (notably at Komoka), together with stalactites and stalagmites are produced, and similar processes on a large scale have deposited the strata in ancient seas and lakes. All limestones effervesce in acids ; but the dolomites effervesce only feebly, unless the acid be heated. In some parts of Canada dolomites abound, but I think they are best shown along the Grand River from Elora to Galt, at Guelph on the Speed, and at some places in Dumfries. It is of several shades, commencing at the top with a yellow color, and becoming lighter and semi-crystalline about 50 feet lower ; while about 100 feet from the top of the series the rock is almost white, and granular in texture—a most beautiful stone. Some thin beds are of a pale brown, still retaining the granular appearance. Between the semi-crystalline and granular textures there is, in some places, a thin band of rock which will powder in the fingers, and seems to be principally sulphate of magnesia. This, however, only appears in places. The dolomites yield excellent building stones, especially in the semi-crystalline series, while the granular layers are chiefly burned for building lime. In fact, the lime produced from these rocks is renowned for its excellence, becoming extremely hard with age, and it is doubtful if as fine a quality can be produced from any other class of limestone. The dolomites of the Guelph series are placed in the Onondaga Salt group of the Upper Silurian, which derives its name from Onondaga, near Syracuse, N. Y. In Canada the Onondaga deposits attain between 200 and 300 feet in thickness, and consist of thin-bedded dolomites, with greenish shales (chiefly argillaceous dolomites), and some masses of gypsum. The latter does not occur in regular beds, but in lenticular masses. The dolomites above the gypsum are generally arched and more or less fissured, while those on which the gypsum rests retain their horizontal position.

This Guelph formation is peculiar to Ontario, its rocks not having been traced beyond the limits of the province. It follows the western limits of the Niagara, and occurs as a bean-shaped mass, gradually thinning out westward toward Lake Huron, and eastward near Ancaster. Its greatest thickness is about 160 feet. Its principal exposures are at the places I have already mentioned. Along the Grand River it frequently presents vertical cliffs 80 feet high.

The fossils contained are small in variety, and most of them are identical with those belonging to the Niagara beds, as Favosites gothlandica and Halysites catenulatus, but others appear to be confined to this formation. As a general rule the fossils are somewhat obscure, and for the most part not very abundant. The most characteristic fossil, and one peculiar to this formation is the Megalomus Canadensis, usually found in the form of internal casts, and I will confine my attention to this fossil.

The Megalomus belongs to the Lamellibranchiata, or conchifera order, which are marine or fresh-water animals of the acephalus (headless) type. In the adult condition they have laminated gills or branchiæ for breathing purposes, and they secrete a bivalve external shell. The two valves are nearly always of equal size, but always more or less inequilateral (A line drawn straight through the middle of an equilateral shell, divides it into two equal parts.) These mollusks are exceedingly abundant in the fossil state, though not so numerous as the brachiopods in older rocks. The existing species, both marine and fresh-water, number about 3,000, but about double that number of fossil forms have been found, which belong to many successive periods, and it is very probable this is only a very small portion of the Lamellibranchiate fauna of the past.

In their classification these mollusks fall into two leading sections and four groups :—

1. Asiphonida.
   (a) Pleuroconcha.
   (b) Orthoconcha.

2. Siphonida.
   (a) Integro-Pallialia.
   (b) Sinu-Pallialia.

The animals of the first section are without the respiratory tubes possessed by the Siphonida, and it is with this first section that we have to do.

The first group, Pleuroconcha, rest in their natural position with one valve *below* and the other *above*. They have but one large muscular impression in the centre of each valve, which forms a shallow pit, occupied by the muscle which keeps the valves closed. An example is the oyster and Ambonychia radiata of the Hudson River Group, Lower Silurian.

The second group, or Orthoconcha, are without siphonal tubes, but their valves are *right* and *left*, instead of upper and under, as regards its normal position, and the muscular impressions are two in each valve. The most remarkable of this genus is the Megalomus Canadensis, of Hall, which occurs in great numbers in the Guelph formation, principally in the form of internal casts, very few specimens showing the original shell.

The Meg. compressus of Nicholson, is allied to the M. Canadensis. It is smaller and more compressed; the umbones are more prominent, and the pallial line more distinct. Other fossils include many varieties of the Murchisonia, and these examples on the table are M. Loganii.

All these specimens are, however, internal casts only, very few having been found presenting the outer shells, and in the case of Megalomus, scarcely anything is known of its outward appearance. The filtration of water and the presence of carbonic acid in the dolomite have destroyed the organic matter of the shell, and left the cast of the interior. There is a great quantity of water in these rocks, saturating the stone heavily in the lower portions, which, when freshly quarried, is quite soft, becoming very hard on losing a portion of the water on contact with the atmosphere. Some of the quarries contain few fossils, others are full of them, and while one quarry may produce good specimens, the majority from others are of scarcely any use for cabinet purposes. Some fossils are also found in the gravels, but are very badly worn.

J. L. Goodburne.

Methods of Concentrating Gold.

There are two methods of concentrating gold—by means purely mechanical and by chemicals. For the efficient separation by the former process innumerable appliances have been invented whose fundamental principle is in nearly every case based on the great specific gravity of gold.

For separating low grade gold ores an interesting appliance has recently come into general use in Western America. It consists of an endless rough-flanged belt passing over two pulleys, one slightly lower than the other, thus giving the upper surface of the belt. Near the lower wheel the pulverized ore is deposited and is carried upward by the revolving belt which meets a stream of cold water. This carries off the quartz, leaving the gold adhering to the rough belt whence it is later deposited in settlers.

Cyaniding and Chlorination have of late received much attention from mining men. The former particularly is made use of in a great majority of up-to-date mills.

The ore is crushed to a pulp before cyaniding and thrown into cyanide vats, after which a solution of cyanide of potassium is added to dissolve the finer particles of gold. The solution is drained off into "zinc" tanks filled with zinc clippings, where the zinc displaces the gold and the metal is deposited with the zinc slimes whence it is easily recovered by retorting.

In chlorination it is not necessary to crush the ore so fine. It is also roasted before being passed to chlorination vats to break up all sulphides. After the barrel is charged with the required amount of chloride of lime and sulphuric acid it is revolved slowly from three to eight hours, when the gold solution is drawn off through a filter into lead-lined settling tanks. From this the gold may be obtained by SO_2 H_2S or by the charcoal method.

The cyaniding process, while it will not save more gold than will chlorination, possesses the advantage of saving from 70 to 80 per cent. of the silver values in an ore as well and hence is in more general use.

J. G. Smith.

The Mastodon of Mount Brydges.

During the summer there was found on the estate of Mr. Duncan Forbes of Mount Brydges the jaw of a Mastodon. The find occurred several feet below the surface in a peat bog.

The jaw weighs 54 lbs., and is 30 inches long by 24 inches wide, by 18 inches high. It differs from the jaws of living animals in its great massiveness—a section through it almost forming a circle. The exterior is black in color and of a hard dense structure, being apparently filled with infiltrated iron.

The jaw contains four teeth—two on either side—none in front. The row on either side is about three inches wide by ten inches long. The front teeth contain three rows of nipples and the rear four rows.

A loose tooth was found to weigh one pound and a half. The teeth exhibit a remarkable degree of preservation, as the enamel remains as it was when the animal died. The tops of the nipples are notched by wear, show the hard black dentine beneath. From their appearance the animal would seem to be herbivorous.

The front of the lower jaw shows a peculiar structure as though it had contained tusks or teeth during the animal's lifetime.

(The finders attempted to reach other parts but have been so far unsuccessful.)

J. G. Smith.

REPORT FROM THE ENTOMOLOGICAL SOCIETY OF ONTARIO TO THE ROYAL SOCIETY OF CANADA.

Through the Rev. C. J. S. Bethune, D.C.L., Delegate.

When a society has attained to mature age, like an individual it cannot be expected that its thirty-seventh year should be marked by any great crisis or any striking event. It is natural, therefore, that the representative of the Entomological Society of Ontario should be able to present to the Royal Society of Canada only a report of quiet work and steady progress since our meeting a year ago.

The thirty-seventh annual meeting was held in November last at London, the headquarters of the Society. The opening proceedings were rendered notable by the joint meeting which was held with the recently organized London Horticultural Society. It was held in the splendid new building of the Normal School and was attended by a large and appreciative audience, representing both the Societies and the general public as well. It was presided over by Prof. C. C. James, Deputy Minister of Agriculture for Ontario, who delivered an address on the value of Horticulture in its various aspects, its intellectual advantages and its attraction for persons of literary tastes. He was followed by Mr. W. E. Saunders, of London, who read a paper on "The planting, care and pruning of the trees in the parks and streets of the city," which is a matter of much importance in a place whose beauty and attractiveness largely depend upon the noble avenues of trees in the streets, and the parks secured to the public by a wise and rare forethought. Dr. Fletcher, Dominion Entomologist and Botanist, then gave an address, illustrated with beautiful lantern pictures, and showing how trees should be grown and treated and the admirable results that have been obtained at the Experimental Farms at Ottawa and in the North-west. He also took up the subject of insects and described a large number of the most destructive species and the remedies that may be most successfully employed against them.

The afternoon of the following day was chiefly taken up with a discussion on the San José scale in Ontario. Mr. G. E. Fisher, Provincial Inspector, who was present by direction of the Minister of Agriculture, gave a full account of the prevalence of this most pernicious insect in several localities, and of the experiments which had been undertaken in order to procure, if possible, a practical remedy. Whale oil soap and crude petroleum were the principal applications employed, and while the former was not entirely effective, the latter was regarded by many as too dangerous a remedy for general use. Dr. Fletcher, Prof. Webster and others took part in the discussion. The attack is believed by all to be a most serious one, and to require prompt and effective measures for its repression.

The 31st annual report of the Society to the Legislature of Ontario was presented at the opening of the last Session and published in February. It consists of 112 pages, illustrated with forty-six engravings in the text and a photogravue portrait of Mr. J. Alston Moffat, for many years past the devoted Curator and Librarian of the Society. The volume contains reports from the various officers and sections, and from the flourishing Branches at Montreal, Quebec and Toronto. There is appended also an account of the second annual meeting of the Northwest (Canada) Entomological Society, which has its headquarters in Alberta.

During the winter and spring fortnightly meetings for the study of Entomology were held on Friday evenings, and alternately with them the Microscopical Section held its sessions: much serious work was done in both departments and great interest was shown by the members. The Geological Section met weekly on Tuesdays under the guidance of Dr. Woolverton, and the Ornithological Section once a month at the residence of Mr. W. E. Saunders, one of the most devoted and well-informed bird lovers in the Province of Ontario. The Botanical Section has been in abeyance for a time, but is now being revived with every prospect of success. From this brief account it will be seen how wide a range of country the Society's operations cover and how many departments of natural science are included in its work.

In the report to the Legislature there are published the papers read at the annual meeting, among which may be mentioned the Presidential address of the Rev. Dr. Fyles, who took for his subject the offices served by insects in the promotion of the fertilization and improvement of plants. He gave an interesting and instructive account of a large number of plants and their attendant insects, and illustrated his remarks with a series of beautiful diagrams of the structure of numerous flowers, the work of his own hand.

Professor Lochhead, of the Ontario Agricultural College, read papers on "The systematic and economic study of forest insects in Ontario," setting forth the necessity of endeavouring to diminish the ravages of insects in addition to the work of protection against fire already undertaken by the Provincial Government: "The silk worm industry in Ontario," which has been begun on a small scale in the County of Essex but which the Professor contends cannot be made a lucrative occupation in this country; "The present status of the San José scale in Ontario;" "Nature-study lessons on the squash bug," intended for the use of school teachers; and an account of the "Insects of the season of 1900," which had proved especially injurious in the south-western peninsula of Ontario.

Mr. J. Alston Moffat contributed papers on "Anosia Archippus yet again," in which he discussed the various theories set forth regarding the migrations of this remarkable butterfly; "Parasites in the eggs of Chrysopa;" and "Notes on the season of 1900," enumerating some interesting occurrences, among which may be mentioned the capture in London of specimens of the curious Myriapod, *Cermatia forceps*, a southern creature which has been gradually working its way to the north.

Professor F. M. Webster, of Ohio, one of our honorary members who takes an active interest in the Society and attends its annual meetings, read papers of much practical value on "Results of experiments in protecting apples from the Codling moth," referring especially to

,the injury wrought by the second brood : "Results of some applications of crude Petroleum to orchard trees," setting forth the danger of its use and the necessity for a much larger series of experiments before it can be recommended as an insecticide to the ordinary fruit grower ; "Two Longicorn Beetles affecting growing nursery stock," viz: *Saperda vestita* and *Oberea bimaculata*, which, though very familiar insects, have not been suspected of making attacks of this kind ; and "Observations on several species of Dermestidæ," a family of beetles well-known for their habits of feeding on museum specimens and many household articles, but not hitherto recognized as phytophagous also.

Dr. James Fletcher, Dominion Entomologist and Botanist, gave a very full account of the Injurious insects in Ontario during 1900," and described the attacks on cereals, fodder crops, roots and vegetables, and fruits, many of which were of a very serious character. Mr. Arthur Gibson, assistant Entomologist at the Central Experimental Farm, described the methods which he had found most successful for "The breeding of Lepidoptera and inflation of larvæ," illustrating the latter subject with some very beautiful specimens that he had prepared.

Reports on "Insects of the Year" were furnished by four of the Directors, Messrs. J. D. Evans, Trenton ; D. G. Cox, Toronto ; James Johnston, Bartonville ; and R. W. Rennie, London. The performance of this duty by these officers of the Society is of much importance as it brings together information regarding the chief insect attacks of the year in the various sections of the Province.

The Rev. Dr. Fyles contributed a descriptive paper on "The Dragon-flies of the Province of Quebec," and short papers were read by Mr. J. Dearness on "A parasite of the San Jose scale ;" Mr. C. W. Nash, "Notes on Danais archippus at Toronto ;" and Mr. P. B. Gregson on "Curious habits of the larvæ of *Dermestes talpinus*." The last named gentleman also furnished an account of the proceedings at the annual meeting of the North West (Canada) Entomological Society.

The volume also contains a synopsis of the most important papers read at the meeting of the Association of Economic Entomologists, which are of great interest and much practical value.

The funds of the Society are shown by the Treasurer's statement to be in a satisfactory condition. The Librarian reports valuable additions of books and specimens, the number of the former on the shelves being almost 1700. The membership of the branches at Montreal, Quebec, and Toronto has steadily increased, and that of the whole Society grows from year to year. All interested in its welfare have much reason to be pleased with its continued success, and the valuable scientific and practical work which is being performed by its members.

The Annual Report, whose contents have just been described, records the practical observations and work of the Society : for the scientific and systematic department reference must be made to the monthly magazine, "The Canadian Entomologist," the thirty-third annual volume of which is now being published. The volume for 1900 consists of 387 pages, and is illustrated with seven full-page plates and thirty-three figures from original drawings. The contributors number sixty four, and represent Canada, the United States, Mexico, Brazil, Great Britain, Germany, Switzerland and South Africa. As there are upwards of a hundred articles, besides short notices and book reviews, it would occupy too much space to mention the subject of each. They may, however, be grouped as follows :

Papers on Classification : North American Yponomeutidæ and Tineidæ, by Dr. H. G. Dyar ; the Wasps of the Super-family Vespoidea, and changes in generic names of Hymenoptera, by W. H. Ashmead ; the Genus Orchelimum, by Jerome McNeill ; the Genus Catocala, by Prof. G. H. French ; Notes on Idiocerus (Jassidæ), by C. F. Baker ; the North American species of Choreutis and its allies, by Prof. C. H. Fernald ; New Mexico Bees of the Genus Cœlioxys, by Prof. T. D. A. Cockerell ; Colorado Bees, by E. S. G. Titus ; some species of Acronycta in the British Museum, by Prof. J. B. Smith ; the Types of Noctuid Genera and a series of papers

on the Classification of Butterflies, by Prof. A. R. Grote; some Genera of Mites, by N. Banks, and the Bibliography of Coccidæ, by G. B. King.

New genera, species and varieties have been described in the Lepidoptera by the late Rev. G. D. Hulst, Dr. Wm. Barnes, Rev. Dr. Fyles, G. M. Dodge, Miss Murtfeldt, W. Beutenmuller, Prof. J. B. Smith, Prof. C. H. Fernald and G. A. Ehrman; in the Hymenoptera, by Prof. T. D. A. Cockerell, C. Robertson, W. H. Ashmead, Dr. L. O. Howard and A. D. MacGillivray; in the Diptera by D. W. Coquillett, C. W. Johnson, A. L. Melander, J. S. Hine and Prof. G. H. French; in the Orthoptera by Dr. S. H. Scudder; in the Hemiptera (Homoptera) by J. L. Handcock, C. F. Baker, E. D. Ball, Prof. H. Osborn, Adolph Hempel, Prof. T. D. A. Cockerell, Prof. J. D. Tinsley, E. M. Ehrhorn, G. B. King and E. E. Bogue; in the Hemiptera (Heteroptera) by A. N. Caudell, and in the Arachnida by N. Banks. Twenty-seven new genera are described and 213 new species and varieties.

Interesting and valuable life-histories of various insects are given by Dr. J. Fletcher, A. Gibson, Dr. H. G. Dyar, H. Bird, J. O. Martin, E. D. Sanderson and Dr. L. O. Howard. Papers on collecting and other observations of insects are given by W. Knaus, E. F. Heath, J. A. Moffat, Rev. Dr. Fyles, H. H. Lyman, J. G. Needham and A. J. Snyder.

In economic Entomology there are important papers by C. P. Lounsbury on Insect Bites and their effects; T. Pergande on a Plant-louse injurious to Violets; Prof. F. M. Webster on the Purslane Saw-fly, Harpalus caliginosus as a Strawberry Pest and the Diptera found in wheat fields; Prof. W. G. Johnson on the Destructive Pea Aphis, and Prof. G. H. French on a Fly causing Epilepsy.

In addition to the foregoing publications, a General Index to the thirty Annual Reports of the Society (1870 to 1899) has been prepared by the editor, Rev. Dr. Bethune, and published by the Ontario Department of Agriculture. It is very full and complete and will prove of much value to all who have occasion to refer to these volumes.

INJURIOUS INSECTS OF THE SEASON OF 1901.

By Prof. W. Lochhead, Ontario Agricultural College, Guelph.

Affecting Farm Crops.

In the south-west portion of the Province the wheat crop suffered severely from the attacks of the Hessian fly. In several counties the yield per acre was very much reduced, notwithstanding the plowing under of a large area both in the fall and spring.

So urgent was the demand for more information regarding the life-history and habits of the pest, that a bulletin was published by the Department of Agriculture in August, and distributed freely throughout the infested areas. This bulletin emphasized the great need for co-operation among the farmers themselves, if they ever hoped to cope with the fly. Late sowing, good preparation of the land to be sown to wheat, and trap-strips, will be found effective if all the fields are treated alike; but if some fields are sown early and become infested with the fly in the fall, there is no way of preventing the flies which emerge from these fields in May from migrating to uninfested fields and damaging them before harvest.

Orchard Insects.

As in previous years, the codling worm (Fig. 17), was the most destructive orchard insect, especially in the sections where the insect is double-brooded. A word of warning may be given here, lest owners of orchards become lax in the matter of spraying with Paris green immediately after blossoming, while attempting to entrap the second brood by bandages. We can never afford to give up spraying with Bordeaux and Paris green, for by doing so the codling worm and fungus diseases are kept in check. The frequent rains about the blossoming period interfered with the spraying operations, and when the applications were not renewed, the effect of the Paris green was very slight indeed.

In connection with the bandages, I find that sacking is the best material for bandages. It is the cheapest as well as the most easily applied and removed. Success with bandages requires careful attention to them every two weeks. They should be removed from the trees and examined for cocoons, then replaced. It is next to impossible to examine the burlaps thoroughly without removing them from the tree.

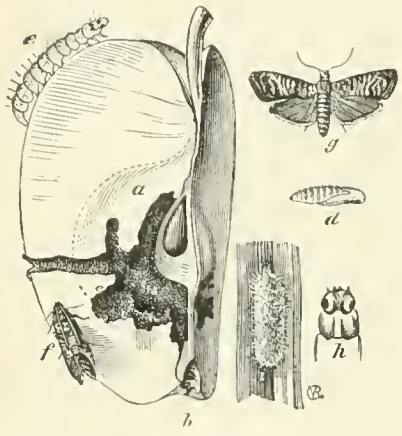


Fig. 17. Codling moth. Quarter of an apple shewing the injury caused by the worm (*a*); the moth (*f* and *g*); chrysalis (*d*); larva (*e*), its head and first segment (*h*); cocoon (*i*). Riley.

The Haseltine trap lanterns were kept burning nearly every night from June 7th to September 7th, to ascertain the kinds of insects that are attracted to such lights. The results are somewhat startling on account of the capture of a large percentage of decidedly beneficial insects. For example, 30 per cent. of all the forms taken were Ichneumon flies; nearly 2 per cent. were Lady beetles and Ground beetles; 2½ per cent. were Dung beetles; 3 per cent. were Mosquitoes and Crane-flies; 1 per cent. Fireflies. Sixty per cent. of the whole number taken were composed of injurious forms, such as May beetles, Squash bugs, Cabbage worms, Cucumber beetles and moths. The strangest thing in connection with the trap lantern experiments was the complete absence of Codling moths. It is evident that as a means of capturing Codling moths, these trap-lanterns are a decided failure.

The Potato Stalk-Borer.—(*Trichobaris 3-notata.*)

Under date of Sept. 14th, Mr. J. A. Auld, M.P.P. for South Essex, wrote me regarding a serious insect attack of the potato vines on Pelee Island, and sent samples of the dying stalks. These branches were widely tunnelled from the base to near the tip. The potato crop will be a partial failure this year and the loss will be serious. In 1900, Pelee Island shipped 30,000 bushels of potatoes, but in 1901, there will be few bushels to spare.

The cause of the trouble is a small snout-weevil (Fig. 18, *c*) which deposits its egg in the stalk some time in late May or early June. A small white grub (Fig. 18, *a*) hatches from the egg, and begins at once to tunnel the centre out of the stalk. It is then nearly half an inch in length, with whitish body and brown head, and legless. It constructs within the tunnel a rude cocoon out of fibres or clay within which it changes to a pupa, (Fig. 18, *b*.) The pupal stage probably does not last longer than two weeks, for in the same stalk I found grubs, pupæ and adults. The adult beetle remains in the vines all winter according to Dr. J. B. Smith.

The only outward appearance of the presence of a pest is the premature blackening of the stalks, and consequent wilting; but when the stalks were handled, and pressure applied, they collapsed more readily than would normal plants.

Fig 18.—Potato Stalk-borer; *a*, grub; *b*, pupa; *c*, beetle.

Although this Borer is well-known in many parts of the Western States, in Iowa, and Nebraska, for example, this is the first record of its presence in Ontario as a destructive potato insect. Fortunately remedial treatment is both simple and practical, from the fact that the adult remains in the vines over winter. If the vines are gathered and burned as soon as possible after the potato harvest, the majority of the adults will be destroyed.

Asparagus Beetles.

Attention was called in my Notes of the last two seasons to the progress of the two species of Asparagus beetles westward from the Niagara river. In 1899 they had reached St. Catharines; in 1900 nearly to Hamilton. This year they were present in the Asparagus beds at the O. A. C. farm in considerable numbers. I have not heard of their appearance in places west of Guelph, but undoubtedly they are *Westward, Ho!* and are bound to join hands with their brothers in Michigan.

At the College the Twelve-spotted species (*Crioceris 12-punctatus*, fig. 19) was by far the more abundant, and it is apparently leading the other species (*C. asparagi*, fig. 20) in its march through Ontario.

Fig. 19. Crioceris 12-punctatus.

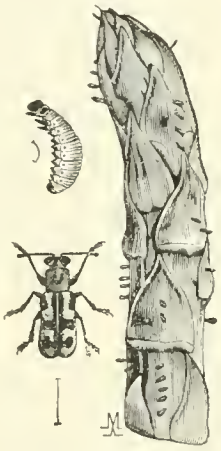


Fig. 20. Crioceris asparagi: beetle, grub, and eggs on plant.

About St. Catharines the beetles did much damage. They appeared in such numbers on the tender shoots and disfigured them so much that the shoots were unmarketable. They seemed to gnaw the epidermis as the shoot was peeping above the ground, before it was ready to cut for market.

It is probable that when greater attention is given to the destruction of the beetles after the spring cutting is over, fewer beetles will hibernate and give trouble in early spring.

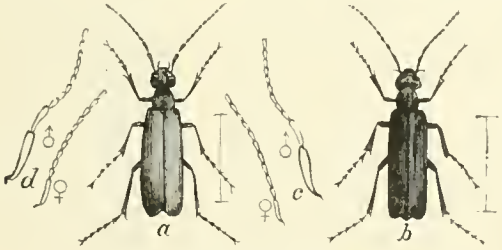


Fig. 21. Blister Beetles—*a*, Epicauta cinerea; *b*, E. Pennsylvanica.

Fig. 22. Epicauta vittata.

Blister Beetles.

These insects were numerous the past season, and in some sections "alarm was beginning to be felt." Three species were common, viz, *Epicauta Pennsylvanica*, *Epicauta cinerea*,

and *E. vittata*. Of these *Epicauta vittata* was perhaps most commonly seen. All are rather soft-bodied insects, and may be distinguished by their color. *E. Pennsylvanica* (fig. 21 *b*) is uniformly black ; *E. cinerea* (fig. 21 *a*) is blackish with grey streaks along the margins of wing covers and middle of thorax ; and *E. vittata* (fig. 22) yellowish with black stripes. The striped species was present in large numbers on beet crops ; the ash-colored species on vetch, horse beans, lucerne, and the black blister beetle on Golden Rod.

When the life-history of blister beetles is studied it is found that their larvæ prey upon grasshoppers, and hence are beneficial. A question, therefore, arises : "Should we destroy the beetles and try to lessen their numbers?" It must be understood that the more adults we kill the fewer larvæ will develop to destroy the egg-pods of grasshoppers, and the greater the number of grasshoppers appearing the following season. When these factors are borne in mind there is good reason for allowing the adult beetles to feed unmolested. They never remain long enough to do much serious injury. They usually appear in large numbers for a week or ten days, but they disappear as suddenly. It is a matter of observation that blister beetles are more numerous than usual the season following one when grasshoppers were very abundant.

Before the advent of the Colorado Potato Beetle these blister beetles were the "potato beetles." In many districts in the northern part of the province they are still the "potato beetles."

Plant Lice.

Plant lice, or Aphids, (Fig. 23), were more abundant than usual this past season. The early spring with its moist, cloudy weather was strongly in favor of their rapid development : and among the more common forms that did considerable mischief were the Cherry Aphis (*Myzus cerasi*), Apple Aphis (*Aphis mali*), Plum Aphis (*Aphis prunicola*), Currant Aphis (*Myzus ribis*), the Rose Aphis, and the Grain Aphis. As Aphids are sucking insects, that take their nourishment in the form of plant juices through a slender tube, arsenical poisons on the plants have no effect. Frequently the presence of a few plant lice in the early part of the season is altogether neglected, when a little trouble at that time would practically exterminate them. Many persons are unwilling to believe that from a few Aphids tens of thousands of them will develop before July. Huxley once computed that "the uninterrupted breeding of ten generations of plant-lice from a single mother would produce a mass of organic matter equivalent to that of 500 million of human beings." As Dr. Howard remarks, this great productiveness is due more to the early age at which the Aphids begin to reproduce, rather than to any extreme prolificacy.

The majority of the generations or broods produced during the summer are wingless, but at intervals winged broods occur. This is very probably a provision for the distribution of the species. The last brood of the season is a winged one, composed of both males and females. Soon after mating the males die, while the females perish after the deposition of the eggs.

Plant-lice have possibly more enemies, which feed upon them, than most other injurious insects. These enemies are Lady-birds, Braconids, Aphis lions, maggots of Syrphus-flies, and certain other dipterous maggots. All of these kill immense numbers of Aphids, and in some instances exterminate them, but in most cases extreme rapidity of development more than counterbalances great mortality.

The Currant Aphis (*Myzus ribis*).

Although never a serious pest, this Aphis disfigures and renders unsightly the leaves of currants. Attention is here called to it on account of the many inquiries

regarding the purplish swellings or blister-like elevations on affected leaves, which make their appearance in May. In the concavities on the under surface will be found clustered large numbers of Aphids, both winged and unwinged, all busy sucking the juices from the leaf.

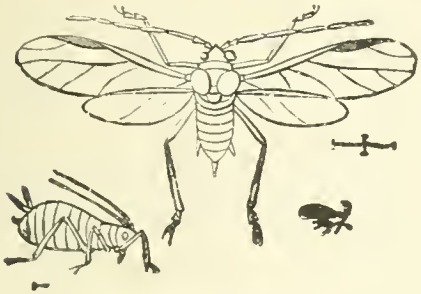


Fig. 23. Plant-lice (Aphis) winged and wingless (much enlarged).

It is seldom that these Aphids are troublesome after midsummer.

Prompt picking of affected leaves, or applications of Kerosene Emulsion, whale oil soap solution, or Gillett's Lye, are the best methods of dealing with Currant Aphis.

Cherry Aphis (*Myzus cerasi*).

During June the cherry trees in many sections became badly infested with plant-lice (*Myzus cerasi*). The leaves of the large terminal twigs were chiefly affected. They became much distorted, and discolored by a fungus feeding on the honey-dew, and with excrement; and then became inrolled with the Aphids feeding within. The effects on the leaves are detrimental to the growth of the tree, inasmuch as much nourishment intended for the development of the tree is taken by the plant-lice within their own bodies.

These Aphids are shining black insects. They frequently multiply so very rapidly that the smaller leaf stalks and twigs become completely covered with them. The leaves and branches near by become very sticky from the abundance of honey-dew excreted.

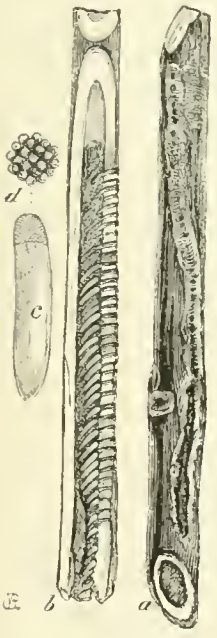


Fig. 26. Snowy Tree-Cricket, *a* twig showing punctures, *b* same split open, showing eggs in position, *c* egg magnified, *d* granulated top of egg. (Riley)

Enemies of the Cherry Aphis are usually present, and kill an astonishing number, sometimes almost ridding the trees.

The life-history of the Cherry Aphis is similar to that of other Aphids which appear on many cultivated plants. They winter over in the egg-stage; in early spring the eggs hatch; and a brood of females appear, which produces living young at a rapid rate on the Cherry up till July, when they disappear. Although not definitely proved, it is probable that the lice migrate to the roots of the Cherry, and to other plants. In autumn, a brood of winged males and females make their appearance. After mating, the females deposit eggs for the winter about the buds of the Cherry.

Fig. 24. Snowy Tree-Cricket, male.

Treatment, to be effective, must begin early, before the Aphids roll the leaves around themselves; otherwise they are difficult to kill. Kerosene emulsion, tobacco solution and whale-oil soap solution are all good.

(10 lbs. of tobacco waste are thoroughly soaked in water; and the solution is made up to 40 or 50 gallons. Dr. Fletcher recommends the addition of 1 lb. of whale-oil soap to the barrel of tobacco solution).

Fig. 25. Snowy Tree-Cricket, Female.

Some Bush-Fruit Insects.

By bush-fruits I mean red raspberries, black raspberries, currants, and gooseberries.

Perhaps more inquiries were made regarding injuries done to bush-fruits than to any other horticultural crop. Fortunately under careful management and treatment most of the insects can be kept under control.

The Snowy-Tree Cricket (Œcanthus niveus). Figs. 24 and 25. Although the work of this insect is readily recognized, yet too many of our gardeners are unacquainted with it. The female in autumn deposits her elongated cylindrical eggs in punctures in rows (Fig. 26), which are nearly vertical on the erect canes. The result is a long, ragged wound, which interferes materially with the growth of the cane. The remedy is to cut out and burn the wounded portions before the eggs hatch in the spring.

The Raspberry Cane Maggot.—In June frequent complaints were made regarding a wilting of the tips of raspberry canes. The pith of the canes was burrowed from the tip downwards for a short distance, then the inner bark was girdled, producing a wilting of the tip. The portion of the stem burrowed is of smaller diameter than normal, and is of a dark blue color. The affected canes usually die, for the maggot continues to tunnel its way downward to the base.

The cause of the mischief is a two-winged fly belonging to the genus *Phorbia*. From observations made in 1891 by Dr. Fletcher, and in 1896 by Prof. Slingerland, it would appear that the girdling commences early in May, and the maggot reaches the base in June. In the case of the specimens sent from Hespeler on June 11th, the maggot had not then reached more than half way to the base.

The eggs are deposited in early spring at the base of the tip leaves. The insect winters over in the pupa stage at the base of the plant.

The remedy in this case also is to remove the wilting tips as soon as noticed, and burn them.

The Pale Brown Byturus.—During June the flowers and flowerbuds of raspberries suffered severely from the gnawing attacks of small, hairy, yellowish-brown beetles. The injured buds scarcely ever develop fruit for the reason that the stamens and pistils are destroyed.

Later in the season when the eggs have hatched, the grubs damage the nearly full-grown berries. When full-grown, the grub becomes a pupa in the earth, where it remains all winter.

The remedy for the Byturus is to spray with paris green and lime solution.

The Raspberry Cane Borer.—On July 1st, Mr. W. N. Hutt, B. S. A., of Southend, sent me specimens of red-raspberry canes which were punctured by this cane-borer. The tips of the young shoots were wilted, and drooping. The rows of punctures around the cane, and the hole between the rows in which the egg is laid were quite evident, as well as characteristic. The grub on hatching from the egg bores downward in the pith, and reaches the root by autumn. There it transforms into a pupa and rests all winter.

The Rose-Chafer.

(*Macrodactylus subspinosus*).

Usually this beetle confines its attacks to roses and grape, and often does much injury to the blossoms. Last June, however, it began eating the half grown peaches in two large orchards near Niagara-on-the-Lake, and considerable alarm was created lest it should spread to neighbouring orchards. The alarm was occasioned by the presence of immense numbers of the Chafers, and by the knowledge that arsenical poisons were of little use in such an emergency. As many as eight or ten chafers were found feeding on a single peach, and but few peaches were left untouched.

It is probable that the most available remedy at the time is to jar the Chafers from the trees in early morning into receptacles, or on sheets where they may be killed. The operation should be repeated on several successive mornings until the danger is over.

The sudden appearance of the Chafers in immense numbers is accounted for by the habits of the larvæ, which feed on the roots of grasses in sandy locations. In the same locations the pupæ are formed, but when the adults emerge, usually all about the same time, they betake themselves to the most convenient orchard or vine-yard. A line of investigation lies open in this connection. If the feeding grounds of the larvæ were discovered and ploughed in spring, while the insects are in the pupal condition, many of them would be destroyed.

The life history is as follows: The female Chafer deposits her eggs in the ground in late June or early July. These hatch in a few weeks, and the grubs feed on the roots of grasses till October, when full-grown they descend still further beyond the reach of frost. In May, they become pupæ, and in June the adults emerge.

THE OAK-PRUNER (*Elaphidion villosum*).

Fig. 27, The Oak-pruner.

Fig. 28, The Oak-pruner larva

Fig. 29, The Oak-pruner pupa

The work of this beetle (Fig. 27) is so interesting that it deserves some mention here. Under date of July 30th, the Hon. Justice Osler, of Osgoode Hall, wrote me an accurate and interesting account of the work of this Borer in breaking off branches of Oak, as observed on some islands in the Georgian Bay, near Parry Sound. At a later date the same gentleman favored me with specimens of the work of the insect from which I was able to get the larvæ (Fig. 28). Mr. Osler writes: On a tree affected by it will be seen the ends of branches hanging down, and leaves brown and dead. Examination shows that they have been deeply sawn through, remaining attached by a bit of the bark. Opening the end of the drooping branch in July or August, a very lively Borer is found in the shape of a fat, whitish grub, who has closed up the passage at his rear by his saw-dust. He does not appear to work backward, towards the trunk of the tree. Near where his life work appears to have begun, which is at the junction of some leaf or smaller branch, are often seen one or two small, hard, semi-cylindrical cases, about the size and shape of the common 'Lady-bird,' empty, but probably the harbor in which the egg was laid which produced him."

The habits of this beetle are described in greater detail by Dr. Saunders in "Insects Injurious to Fruit," pp. 31, 32; and by Dr. Packard in the "Fifth Report of the Entomological Commission," pp. 83-89. It is not only injurious to the oak but also to the beech, chestnut, birch, hickory, peach and apple. Dr. Saunders calls it "The Apple Tree Pruner."

Attention may be directed here to the wonderful instinct which the insect undoubtedly possesses. The female deposits an egg in an angle of a leaf stalk, near the tip of the twig. The grub, on hatching, feeds on the soft, pulpy pith, until it reaches the branch, when it gnaws the harder, woody tissues, and begins tunneling the branch to its base. Then the sawing process occurs. "This," Dr. Fitch says, "is a most nice and critical operation, requiring much skill and calculation, for the limb must not break and fall while he is in the act of gnawing it apart, or he will be crushed by being at the point where it bends and tears asunder, or will fall from the cavity where it breaks open and separates. To avoid such casualties, therefore, he must, after severing it, have time to withdraw himself back into his hole in the limb, and plug the opening behind him before the limb breaks and falls." With the eye of a trained woodman, he "cuts the limb asunder so far that he supposes it will break with the next wind which arises and withdraws himself into his burrow, and that he may not be stunned and drop therefrom, should the limb strike the earth with violence when it falls, he closes the opening behind him by inserting

therein a wad formed of elastic fibres of wood." Usually his sawing is so accurate that he has not long to wait before he falls with the limb. After the branch has fallen the grub continues to eat and grow. It changes to a pupa (Fig. 29) sometimes in the fall, but usually in the spring. The adults appear in June, the female to lay her eggs as already described.

March Flies (*Bibio*).

Under date of May 29th, a correspondent at Weston sent me three specimens of Bibio. He says:—"Yesterday our beds were infested by an immense quantity of flies,—eating Pansy buds, and also the flowers." At other dates also, reports have been received regarding the supposed damage to plants by these flies; but although I have invariably at the time asked for specimens actually seen injured by the flies, I have never received any. It is hardly likely that these flies injure the buds and blossoms, although the maggots are known to attack the roots of grasses. The usual food of the larvae, however, is decaying vegetable matter.

In the discussion which followed upon the reading of this paper Prof. Webster referred to the Hazeltine Moth-trap, which he denounced as a perfectly useless affair and recomended that the Canadian government should impose a duty of $5.00 on everyone imported into this country in order to prevent its introduction, 40,000 had been sold in the United States this year and the owners expected to sell 50,000 next year. He had yet to learn that it had caught any codling moths, or at any rate more than a very few, though it professed to exterminate them in the orchard where it was placed.

The Potato Stalk-borer he had found destructive to tomatoes and egg-plant as well as potatoes, near Lake Erie. The 12-spotted asparagus beetle had not yet been found in Ohio, but was evidently spreading rapidly. For the Rose Chafer he could not advise poison, as no poison had been found to kill it, it would eat those in ordinary use and apparently thrive on them. It can however, be destroyed on fruit-trees by using a can with some coal-oil in it attached to the end of a pole and knocking off the beetles into it with a light rod; this can best be done early in the morning when they are not so active as in the heat of the day. It breeds in sandy soil which is not very dry, and forms its pupa there; the least disturbance of the soil by cultivation will kill it out.

Mr. Moffat presented an acccount of the death of a woman at St. Thomas which was supposed to have been caused by the bite of an insect. He had obtained the specimen from the doctor in attendance and exhibited it to the meeting. It proved to be the well-known ground beetle, *Galerita Janus*, Fabr., which is usually found under stones in moist places and is classed among beneficial insects. As this beetle was found in the patient's bed four days after she was taken ill, it seems incredible that it should have had any connection with the blood-poisoning, which began in the patient's face so many days before, and terminated fatally.

NOTES ON THE SEASON OF 1901.

By J. Alston Moffat, London.

After an unusually severe January, February and March a favorable opening of spring was anticipated, but in that we were disappointed in this locality. April was cold until near the close, when we had a few warm days, which had a marked effect on insect life, and brought forth *Hymenoptera* and *Diptera* in profusion, whilst the hibernated butterflies enjoyed the bright sunshine immensely, and the small blues came out in numbers. May was decidedly disappointing. For although it brought forward vegetation rapidly, it was quite too cool to pro-

mote the development of the larger forms of Lepidoptera, so that the lilac blooms passed without the appearance of sphinges and other moths that usually attend their attractive feast. June 1901 was reported to be the coldest June experienced in a great many years. But on the 24th it took a turn, and a hot term followed, which lasted for five weeks without a break, with such extreme heat as will have impressed itself on the memory of those who passed through it for the rest of their lives. Such peculiar weather conditions had the effect of disarranging the usual appearing of common forms of insects. Some came out sooner than usual, others were late in showing themselves, and others failed to put in an appearance at all, whilst a few kinds were extremely abundant.

Never before have I seen *Aphides* so prevalent, they were out in all their kinds and colors, on root and branch, and in such masses. But to make amends the lady bird larvæ were noticeably numerous, and no doubt this was the cause of their greatly reduced numbers at the end of the season. The potato beetle was late in appearing, but was in more than usual abundance later on. The imported cabbage butterfly remained scarce until the late summer broods

Fig. 30 —The Yellow Swallow-tailed Butterfly (*Papilio turnus*.)

appeared. *Papilio turnus* (Fig. 30), the yellow swallow-tailed butterfly, appeared early and stayed late. It was seen about the middle of May, and was not wholly absent in the middle of August. A long continued period on the wing, which I have often seen but cannot account for, and which seems to require some explanation. Neither the Thistle butterfly, the Hunter or the Red Admiral were much in evidence during the season here. The *Argynnids* in their various species were moderately plentiful. About the middle of August I received an intimation from Mr. J. D. Evans, of Trenton, that he had taken a specimen of *Papilio Cresphontes* there in fair condition, the furthest east it has yet been reported in Canada. About the same time Dr. Bethune observed one in London ; and on the 25th I picked a damaged specimen off a flower with my fingers, the first of the kind I have seen abroad in several years. It was also reported to me as having been taken in other places in this neighborhood. So that southern butterfly has not yet succeeded in establishing itself as a permanent resident in this locality ; it is even now but a periodical visitor.

Anosia Archippus (Fig. 31) was late in arriving, and remained scarce through the season. The first one I saw was on the 12th of June, in a very worn and faded condition. Then I saw another on the 15th, so bright and fresh that it might have passed for a newly emerged specimen. I received from Mr. Henry Bird, Rye, N.Y., a letter dated 15th May, 1901, in which he

remarked that he had seen an *Archippus* butterfly before that. As scarcely any of the observations published upon the movements of *Archippus* have come from New York State, I take the liberty of giving publicity to the remarks on the subject which he so kindly favored me with, never suspecting that they would go into print. But as they are so interesting in themselves besides assisting in illuminating a page of *Archippus* history, I take pleasure in producing them for the benefit and enjoyment of others.

"My observations, Entomologically, are very meagre so far. One *Archippus* butterfly was noted. This one was sailing along rapidly, a couple of feet from the ground, with an eye open for the first appearance of the milk weed no doubt, and was skimming northward eight or nine

Fig. 31.—The Archippus Butterfly.

miles an hour. It was a worn specimen, and though its progress through the air was much faster, its angling flight searching for milkweed would bring initial progress at about this figure. As I was following in my buggy and had the example in sight some ten minutes I could judge pretty well of its progress.

"But in crossing water much better time is made, of course, and I have made some observations here. I have explained how my home is situated on the shore of Long Island Sound, a long, narrow body of salt water, eight miles wide at this part, and 120 miles long. Long Island, a great sandbank of glacial days, lies the other side of this Sound, and divides it from the Atlantic ocean. Although the warm Gulf Stream swerves off from our coast much further south, still there is some effect on the Long Island fauna, and it affords many features belonging to a more southern latitude. So naturally we may look for southern migrants from that quarter, and this is amply borne out in actual observations. In my younger days, when the "struggle for existence," etc., was not so pressing, I used to find time for a day's fishing now and then, and in a row-boat would anchor a half mile out from the shore on some submerged reef, in about thirty feet of water, and catch the rock-bass in which the Sound abounds. Passing a day in this manner, one has time between bites—both of the bass and of luncheon—to notice what is going on overhead. And one is sure to be struck with the number of butterflies constantly coming from the Island to the main shore. We might expect the supply to be largest on the main land, and that emigration would be going the other way, yet it is invariably as first stated. By far the largest number seen will be *Archippus*, next *Papilios* and *Colias Philodice*. *Archippus* fly at the highest elevation, but begin to drop on nearing shore, so on passing the fishing grounds are sometimes within reach. I have watched them so many times, and their numbers and flight are surprisingly regular. The species seems on the wing continually during the last half of the season, and their flight over the Sound waters seems most methodi-

cal But in this case—they are going north, mind—they fly singly. To a watching fisherman, as an example gets abreast of his boat, he may look out across the water and see another coming in about the same track, and if he strains his eyes a bit, still another, just a speck, can generally be made out, well up in the blue. And so it goes on through the warmer hours of the day. *Archippus* or *Turnus* do not mind the flight at all, but poor little *Philodice* or *P. rapæ* are glad indeed to settle on the first bit of herbage or flower they can reach. So the number which cross this body of water is large, and one rarely sees an example in the water.

"The most striking emigration in point of numbers that I recall as coming from Long Island was that little white and black speckled geometer—*Caterva Catenaria*, which came over in myriads during one whole day, and gave our landscape quite a snow-squally effect. But these feeble flyers were dependent on a stiff breeze for making the trip at all, and then about half of them fell in the water. So much for emigration."

In reference to the point which Mr. Bird has called my attention to: that those separate specimens of *Archippus* were all flying north when crossing Long Island Sound, I would remark, that in doing so at that time they are as certainly obeying their natural inclination to travel, and that for a purpose, as when they go south in crowds later in the season. For, if those single individuals could have been traced to their destination it would have been found that they were making for a general gathering place, where they were forming one of those immense swarms which have attracted so much attention, preparatory to their leaving in a flock to go south together. So the fact of their going north at that time does not conflict with their going south later on, as they have to gather from all directions, at what appears like a preconcerted place of meeting. Constrained by an internal monition, or drawn by some invisible magnetic influence, they gather from every point of the compass to one particular place, as unerringly as the needle turns to the pole, and there await the gathering of the crowd, to start out at the proper time on their long southward journey. As they do not, so it seems that they cannot at that time go singly; and the belated stragglers that are left behind the migrating flocks in this latitude, assuredly perish.

Numbers of *Archippus* butterflies were to be seen flitting about the streets of London, during the first week of September, and occasionally stopping to feed at moist places. The last one observed on the wing was on the 27th of the month.

About the first of September Mr. Balkwill brought in some beetles that had been found feeding upon green corn inside the husks, with a sample of the injured corn. The beetle proved to be *Euphoria inda*, Linn. (Fig 32), a well-known injurious flower beetle, also bearing an unsavory reputation for spoiling soft ripe fruits, such as pears, plums and peaches. It was the first time my attention had been drawn to its attacking corn in this country, although it is known as an old offender in that direction in the south-western States. From the appearance of the corn that was presented, it is evident that this beetle is quite capable of doing a vast amount of damage in a cornfield where they are numerous; which, fortunately for Canada, they have not, so far, been found to be. Their ability and method of reaching the corn inside the husks has been a subject of considerable discussion in the localities where their injury has been greatest, some claiming that it is only after the husk has been torn open by bird or beast that the beetles can reach the grain. But from the wonderful strength with which they are endowed, which every one who has handled them must have noticed, one could readily believe that they would have no difficulty whatever in pushing their way inside the husk by the silk end. And, seeing that they bury themselves in the ground to pass the winter, they might easily dig through the husks in order to obtain the succulent morsels within, in the absence of other things within their reach wherewith to satisfy their cravings.

Fig 32.

THE PAINTED LADY BUTTERFLY,

(*Pyrameis Cardui*, L).

By James Fletcher, Ottawa.

The irregularity in the appearance of the Painted Lady Butterfly has frequently been noticed by entomologists. For several years the species will be scarce or almost unseen in a locality, then suddenly large numbers will appear, winging their bold and fearless flight in every direction, and will produce what, among collectors, has been called a "Painted Lady year." This insect is one of the very few which are identical with their European representatives, and this one has a very wide distribution, being found, with very slight variations, almost all over the Northern hemisphere. The sudden appearance of a swarm early in the season is due to the migratory habit of this strong-winged fly. There are two broods in the season, as with most of the Vanessians. When I was a boy in England, an annual excursion eagerly looked forward to was a visit made to some caves at Upnor, on the River Medway, a few miles from Rochester. Late in November or December, armed with an unnecessarily large supply of tallow candles and matches, a select party of youthful aurelians used to hie to these caves for the unusual pleasure of catching butterflies in winter. Having reached the caves, we had to enter by crawling over a mound which almost filled the mouth of the cave, when a comparatively large chamber was found with three or four passages running off in different directions. Here the candles were lighted. In small pockets along the passages, hibernating specimens could always be found of the Peacock Butterfly, *Vanessa Io*, and the small Tortoise-shell (*Vanessa urticæ*) of about the same size, and with very similar habits to our Canadian (*V. Milberti*), to which indeed, unless the two are put side by side and compared, it bears a somewhat close superficial resemblance. Occasionally in these forays, we were lucky enough to find a few Painted Ladies. All the butterflies were hanging from the upper surface of the passages or crevices, with their wings closely shut, and with the antennæ drawn back between the wings. The Peacocks and small Tortoise-shells were easily seen, owing to their dark colour, but the beautiful mottled under-sides of the Painted Ladies made them rather hard to distinguish in the flickering candle light. This butterfly cave was supposed to be a very secret hunting ground, and all who visited it were in honour bound only to take such specimens as were perfect, and only just so many as they actually required.

The Vanessians hibernate in the same way in this country, not only in caves but in hollow trees and in buildings. *Grapta j-album* and *Vanessa Antiopa* I have frequently hibernated artificially in a rather dark unused attic, or in a wooden box behind a fence out of doors. This habit of hibernating in the perfect state is accountable for most of the occasional notices in newspapers of the appearance of butterflies in warm days during the winter.

Last spring the Painted Lady was not uncommon at Ottawa in early June, but was not noticed with *Vanessa Antiopa*, *Grapta j-album* and *Grapta Progne*, sipping maple and birch sap in May. The butterflies came suddenly in June; all through the month, until the new brood appeared about the middle of July, they were a conspicuous feature of the woodland, along roads, in gardens, and in clover fields. The flight of the Painted Lady is quick and irregular; it seldom stays long in the same place, flying hap-hazard from flower to flower in a most unbusiness-like manner, always ready for a gambol with another of its kind, dashing close past or circling round and round a new comer. It flies, too, later in the evening than any butterfly I have observed, and at that time of the day seems to delight to settle on buildings. Two or three specimens will sometimes choose the same tower of observation, over and around which they will chase each other apparently with great delight, stopping occasionally in their wild flight, and soaring upwards opposite to each other like two boys, sparring for several seconds at a time. Not only will these intrepid insects dash at other butterflies, but they seem particularly

fond of worrying the large locusts—*Dissosteira Carolina* and the clicking *Circotettix verruculatus*—when these are flying by or are hovering in the air over their mates. These clumsy flyers, surprised and indignant at the unexpected onslaught, make a few spasmodic efforts to evade their nimble persecutors, but soon settle down with rustling wings to the ground.

The Painted Lady seems particularly to enjoy flying round and round the tops of mountains. Collecting on the bare black summits of mountains, where there is little cover, is always a matter of some difficulty, but this is much increased by these frolicsome, restless, fickle, "ladies." After carefully stalking, perhaps creeping on all fours, over hot rough rocks, towards a much desired Argynnis, or Chionobas, which, although very much on the alert, has at last settled for a few moments, how often are the collector's hopes dashed to the ground by seeing one of these restless sentinels rush in and stir up his quarry, driving it off over the edge of the mountain, not to return again for a long time. This, however, is far from being the case with the unwelcome tormentor, which is back again within a few moments, sunning its wings within a few feet of him, but just beyond the reach of vengeance, and ready for the next effort. *Vanessa Californica*, a cousin of the Painted Lady, was not uncommon during the past summer in the Rocky Mountains and was also found to have the same, in the eyes of the collector, most objectionable habit.

In Dr. Scudder's splendid work, the "Butterflies of the Eastern United States and Canada," a most interesting account is given of the Painted Lady and its habits. Quoting from Meyer-Dur, he says, "Its wildly timorous behaviour is quite striking; it is uncommonly audacious: swift and savage it dashes irregularly about, scarcely observing the pursuer; heedless of the net it returns directly to the place it has left, and sits with horizontally opened wings on the dry earth or spots of sand. It is a nimble, lively, youthful, untamed, petulant insect which shows in its behaviour no resemblance to its proud but circumspect neighbour *Atalanta*."

Dr. Scudder says himself of this butterfly: "It frequently alights on stone walls heated by the sun, and is greatly attracted by flowers, particularly by thistles and the other plants upon which the caterpillar feeds; here it may readily be taken; not so in other spots, for although very fearless, and even impudent, it is exceedingly wary, dashing off headlong at the slightest alarm."

In 1884 a remarkable occurrence of the Painted Lady Butterfly was noted, and the fact was recorded by Dr. Saunders in his presidential address to the Society (Can. Ent., xvi., p. 211) that it was so numerous in Manitoba as to have been the cause of some alarm to farmers, who feared that the caterpillars might attack some of the growing crops. A similar invasion occurred last summer (1901) in North America and caused at first much anxiety to farmers in the West. The species was noted at Ottawa, and the insect was extremely abundant at Nepigon and from that point westward to the Pacific. Newly emerged specimens were taken at Nepigon on the 1st July. Manitoba seems to have been the centre of greatest abundance in Canada. Mr. A. J. Dennis, of Beulah, Manitoba, writes on the 10th June: "*Pyrameis Cardui* is as a rule an uncommon species here. I have never taken more than one or two specimens in a season, but this year they are in countless numbers. They simply cover the prairies and have been flying in all directions for the last six weeks." A few letters were received from farmers anxiously enquiring whether the caterpillars which were abundant on summer-fallows, were likely to attack crops after they had finished the weeds. They were informed that this was not in the least likely. Mr. Donald Macfarlane of Oak Lake, Manitoba, writing on the 25th June, says: "These caterpillars first appeared in this district during a spell of dry weather about two weeks ago. They were first seen on thistles and other weeds which they rapidly devoured, and are now spreading over many other plants; even the roadways are strewn with myriads of these insects, all seeming to be in sympathy with the Government's immigration policy and moving westward." In travelling through Manitoba early in July I saw large numbers of the caterpillars feeding upon the Canada Thistle, but particularly upon the Borraginaceous weed, Blue Bur

(*Echinospermum Lappula*). This was a new food plant for the species, and it is rather remarkable that it should have been so conspicuously the favourite food plant in the West. The Blue Bur is not indigenous on the prairies but has spread rapidly as an agricultural weed in Manitoba and the North-West Territories during the past year or two. Upon some fields which had been left for summer-fallowing large patches of this weed could be found stripped bare of every leaf by the caterpillars of the Painted Lady. Other plants noticed in different places, which were eaten by this caterpillar, were the Western Mugwort (*Artemisia Ludoviciana*) and the Pearly Everlasting (*Anaphalis Margaritacea*). In a few instances, caterpillars were seen upon the small Round-leaved Mallow, and were reported on holyhock and burdock. At Kaslo, B.C., I was surprised to find the larvæ feeding (30th July) on the prickly Borraginaceous plant, *Amsinckia intermedia*.

It is probable that our Canadian swarm may have come from the south and west. Mr. J. W. Cockle, of Kaslo, on Kootenay Lake, B. C., an energetic and very observant entomologist, wrote me last spring that on May 2nd a swarm of this butterfly had passed Kaslo. He says: "They were here on that date in thousands, but most of them only stayed a day or two; from which I suppose they have migrated to some other point." At the same time Mr. Cockle sent me the following interesting extract from the Spokane Review of May 26th:

MIGRATION OF BUTTERFLIES.

Spokane Review, May 26.

COUNTLESS THOUSANDS OF THEM FLYING OVER SOUTHERN CALIFORNIA.

"For weeks a remarkable migration has been taking place in southern California, and is still in progress. The migrant is a brown butterfly, known as Pyrameis cardui.

"At first the butterflies were noticed in twos and threes, then in dozens, then in countless thousands, all flying in one direction, to the northeast and parallel to the Sierra Madre range. Some idea of the numbers can be conceived when it is said that in looking across a lawn 90x40 feet four or five butterflies were continually crossing the line of vision, and this was true, so far as could be learned, of every lot in the vicinity.

"The insects move with a regular rate of speed, always in the same direction; now in pairs, again singly or in groups of 10 to 12. Such specimens examined show that they had trave led a long distance, and it is thought by some that the migration began in Mexico, hundreds of miles away.

"In attempting to guess at the cause, it may be assumed that it has been a favorable year for this butterfly in some region to the south, and that the countless caterpillars have changed into butterflies in such swarms that to obtain food they have begun this migration, the direction of which has been governed to some extent by the mountain range."

It may be the case that after this year *P. Cardui* will be less abundant than usual for some years, in accordance with the rule which seems to govern the occurrence of insects in general, namely, that an excessive abundance of a species generally foretells an unusual scarcity the next or the following year. Any remarkable observation concerning insects should always set the careful observer thinking, so that, if possible, the cause for the unusual occurrence may be discovered.

At the end of Dr. Scudder's article he gives the following under the head of *Desiderata*: "Cardui is one of the best subjects of study for those who wish to investigate the causes of irregular apparition; and only those who spend much time in the field can hope to solve the problem. A close observation of the comparative abundance of the butterfly for several consecutive years in the same locality, accompanied by the attempt to rear hundreds of the caterpillars, selecting only those which are very nearly full grown, and recording the proportion of healthy and infested ones, will probably show whether the attack of parasites is a *vera causa*.

The above is submitted to our members to remind them that there is still good work to be done even with this showy and not uncommon species. Should the insect appear again next year in any abundance, efforts should be made to carry out Dr. Scudder's suggestion with a view to solving the points raised. Exact dates of the first appearance of the butterflies and notes as to the times of greatest abundance should be carefully kept, and, if these facts are recorded by several observers at different points, they would certainly furnish much valuable information towards solving this problem.

THE NORTH AMERICAN FALL WEBWORMS.

By Henry H Lyman, M.A., Montreal.

The name Fall Webworm, as is well known, was given by Harris to the caterpillar of the moth which he described under the name *Arctia Textor*, but for which he subsequently erected the genus *Hyphantria*, putting also in it the Many-Spotted Ermine Moth of the South, originally described under the name *Bombyx Cunea* by Drury. As I have already given in the "Canadian Entomologist" * a somewhat extended historical sketch of these moths, it is not necessary to repeat it here.

The earliest published opinion that *Cunea* Drury and *Textor* Harris were not specifically distinct, which I have been able to find, was that contained in the short paper by Mr. Graef in Bull. Brooklyn Ent. Soc., III. 14, 1880, he having taken all intergrades between immaculate and heavily spotted, and having seen the two forms in copulation, as had also Mr. Otto Meske of Albany. In the August number of the same journal, Mr. G. H. French recorded having bred both forms from a nest of caterpillars which had apparently just hatched from a single cluster of eggs deposited by a single moth. In the same year, Riley in the General Index to his Missouri Reports also placed *Textor* as a synonym of *Cunea*, but in Grote's Check List of 1882, *Textor* and *Punctata* stand, apparently, as good species, though without numbers, *Punctatissima* A. & S. being the only name given as a synonym of *Cunea* Drury.

In 1887 Riley issued Bulletin No. 10, U.S. Division of Entomology, on "Shade Trees and their Insect Defoliators," in which, writing of the Fall Webworm, he said, "The moths vary greatly, both in size and coloration. They have, in consequence of such variation, received many names, such as *cunea* Drury, *textor* Harr. *punctata* Fitch, *punctatissima* Smith. But there is no doubt, as proven from frequent breeding of specimens, that all these names apply to the very same insect, or at most to slight varieties, and that Drury's name *cunea*, having priority, must be used for the species."

Since that date, it seems to have been generally accepted that we had only one species varying greatly, and even *Congrua* Walker was supposed on Mr. Butler's authority to be merely a variety of *Cunea*. Having no evidence to urge against this conclusion, and having no acquaintance with the Many-Spotted Ermine Moth in life, and only a pair in my collection, I, as so many others continually do, accepted perfunctorily the dictum of these authorities, though living in the *Textor* region where *Cunea* does not occur, I could never really bring myself to believe that the two forms belonged to one species, and thus the controversy which started in the May 1899 number of the "Canadian Entomologist" over the question as to what species was the true *Cunea* of Drury quickened my interest in the Fall Webworm moths, and I determined to solve the problem if possible. I therefore appealed to Dr. Harrison G. Dyar to secure for me eggs of *Cunea*, and this he kindly did, instructing his assistant to get them for me.

On 3rd August I received from Washington a batch of eggs mailed on 31st July, accompanied by the moth which laid them, and which was still alive and still ovipositing.

* Vol. XXXII. 122.

The eggs were deposited on the underside of a leaf, and were described as follows :

Diam. ½ mm., finely pitted, of a pale delicate green, the batch covered with white down from the abdomen of the ♀ but those laid after the moth reached me had very little of the down about them.

Riley described the eggs as being of a bright golden-yellow colour, having, on account of the pitted surface, the appearance under a magnifying lens of a beautiful golden thimble, but this is erroneous, as I have had and examined many clusters of these eggs, and all were of a pale, delicate green. Occasionally a few yellow eggs will be found in an egg cluster, but these appear to be bad ones, as I have never known them to hatch. The parent of this first brood, which I called No. 1, was a little rubbed, but so far as I could see was immaculate. It is shown on the plate as fig 1. (See frontispiece plate).

The larvæ hatched on 11th-13th August, giving an egg period of about 12 days in the latitude of Montreal.

These larvæ were carried by me to Rockland and Portland, Me , and back to Montreal, through the White Mountains, and were thus never out of the *Textor* region. They were fed on American Elm. For comparison, I also secured a part of a batch of *Textor* larvæ from a nest on a birch tree in Mount Royal Park, but having been entrusted to a friend while I was at the seaside they were, on account of their commonness, somewhat neglected, and only about half a dozen survived. When the larvæ of both forms were mature, I immediately saw that they differed strikingly from each other. The larvæ of *Cunea* vary considerably among themselves, but only within the limits of what may be called the *Cunea* form, never to my knowledge, and I have bred not far short of a thousand of them in various broods, varying in the direction of *Textor*.

The distinction between these larvæ may be broadly stated as follows :

Cunea has the lateral broad band, light in color, not much sprinkled, and the warts on it yellowish, the upper row occasionally tinged with orange, and the hairs chiefly blackish gray *Textor* has the lateral band heavily sprinkled with black dots, giving it a bluish appearance, the warts upon it orange-red, and the hairs chiefly foxy red-brown.

These larvæ thus differ much more than the larvæ of many allied species whose distinctness is never called in question. Probably owing to the latitude in which they were raised this first brood matured slowly, and as the season advanced it was difficult to secure any green elm leaves, and to keep them fresh for any length of time. Some of this brood seemed to be affected by some intestinal trouble, the pellets of frass remaining held to the anus by a reddish filament. One was observed to have no less than four such pellets in a chain attached to the anus. When elm was no longer to be had I changed the food to apple, and was able to secure this in a green state even after the first frosts.

Those larvæ which spun up among the leaves were placed in a box with a zinc pan in the bottom, covered with a layer of crushed quartzite kept moist, the box being covered by a pane of glass, but those which spun up attached to the floor and sides of the breeding cage were not disturbed.

The specimens kept in the damp box began emerging on 18th March, 1900, and continued to do so up till the 12th April, when I left on an Easter trip to New York, Philadelphia, and Washington. Up to that date none had emerged in the breeding cage, and I feared that they must have become dried up, but on my return home on the 21st, I found that a number had emerged, and they continued emerging up to the 16th May, being thus just one month later than those kept in a moist atmosphere.

About seventy five specimens in all were reared, though some were crippled or otherwise damaged and not worth preserving, and of these only four females were absolutely immaculate, that is, about 5 per cent. of the whole brood, or about 10 per cent. of the females. Many of the latter sex were quite heavily marked, more so than the average male of ordinary broods,

and the statement of Smith & Abbot, "the female being entirely white, is thus seen to be incorrect, though in the majority of cases it is true, and in the other broods raised by me, spotted females were of extreme rarity, not occurring at all in summer broods and very rarely in spring broods. Figures 2-11 are of this brood, showing the variation from heavily spotted to immaculate.

Had I been contented with the results attained in rearing this most remarkable brood I would have maintained that such a thing as an immaculate male *Cunea* did not exist, and should thus have been quite as far astray in my conclusions as the many authorities who have written of these forms.

But in order to see what difference, if any, existed between the spring and summer moths, I appealed again to Dr. Dyar to supply me with a batch of eggs along with the parent moth. This he was unable to do, as he did not secure any of the female moths, but he sent me two broods of young larvæ whose depredations upon sycamore trees had just begun to attract his attention.

These broods I named A and B, and as it was too much trouble, especially for the friend with whom I left them when I sailed for England in June, to go up the mountain to my sycamore tree for fodder, the food was changed, and brood A was reared on elm and brood B on apple.

On my sudden return from England on 8th July I took over the care of these broods and carried them on to imago, but to my surprise very few of brood A emerged, though the moths from brood B emerged very freely. The dates of emergence ranged in brood A from 27th July to 19th August, and in brood B from 27th July to 13th August. The moths from these broods were hardly at all spotted, a few only of the males being lightly marked, while many males and all the females were absolutely immaculate, and so indistinguishable in the imago state from *H. Textor*, but the larvæ had been of the *Cunea* form, though not quite so dark as the fall brood of larvæ reared in 1899. These moths are shown Nos. 13-16 summer brood A, Nos. 24-27 summer brood B.

From a mating between A and B I secured another batch of eggs, which in due time hatched and produced brood AB.

As Dr. Dyar had also been rearing a number of broods of *Cunea* at Washington I suggested dividing broods, each sending the other a half of one of the broods, in order that we might see what difference, if any, would result from difference of latitude.

I sent a share of brood AB to Washington and received in exchange a portion of one of the Washington broods resulting from a mating of moths of the summer brood. No distinguishing number was sent with this brood, and I merely marked it "½ Dyar's brood." Unfortunately Dr. Dyar's assistant omitted to make a note as to which brood he divided with me, and I am therefore unable to compare my results with those obtained at Washington.

The moths of this brood from Dr. Dyar emerged from 28th April to 10th May, 1901, and were almost immaculate, only a very few of the males having a few dots, Nos. 29-33 showing the range of variation.

The result of this brood proves that a spring brood may be quite as lightly marked as the most lightly marked summer brood, and it is probable that the influence of the parents is a potent factor in determining the result, but that, other things being equal, a spring brood will be more heavily marked than a summer one, was demonstrated in the most remarkable manner in brood A.

I have already mentioned that very few of this brood emerged in July and August, 1900, the great bulk of the brood going over the winter, thus showing the tendency of the double brooded *Cunea* of the South to become a single brooded moth in the latitude of Montreal.

The contrast in this brood between the summer emerging moths and those which passed the winter in the pupal state was most marked, as many of the males were heavily spotted, though

some of the males and nearly all the females were immaculate, only one or two of the females being lightly spotted, Nos. 17-22 showing the range of variation in the spring part of brood A.

As already mentioned, nearly all of brood B had emerged in July and August, 1900, but three or four emerged in the spring of 1901, and No. 28 is a male of that brood which went over winter, showing the same tendency to heavy marking in the spring brood, and this fact has a very strong bearing upon the question of the specific distinctness of these two forms, for if both belonged to one species, *Textor* having only a spring brood in this region, should be a spotted form instead of being an immaculate one.

In the summer of 1900, I also secured part of a brood of *H. Textor* larvæ on Montreal Mountain, and sent a portion to Dr. Dyar, but he did not succeed in getting any through. I was successful with those I retained, but, curiously enough, a few emerged in the autumn, but those which emerged in the spring came out a little later than the *Cuneas* of brood A.

The latter emerged between the 5th and 15th May, with one belated one on the 20th, and another on 26th, while the *Textors* did not begin to appear till the 19th May, and came out between that date and 2nd June. Dr. Dyar succeeded with the portion of brood AB which I sent him, but, unfortunately, I did not with the ones I retained. They, were I fear, confined too long in a glass jar, and so became unhealthy before being transferred to a cage, and died off shortly after I left on my second trip to England, so here again we were unable to compare results.

A very important point which I brought out in my experiments was the refusal of *Cunea* and *Textor* to mate. At least three times was the experiment tried, when conditions were favourable, both moths being freshly emerged, but always with the same result, although they were left together for days. That no mating took place, I am positive, as close watch was kept at frequent intervals, and in a mating of *Cunea* which was timed, copulation continued from about 11 p. m. till about 8 p. m. the following evening. The *Cuneas*, however, mated all too readily among themselves.

To sum up the results of my experiments extending from the summer of 1899 to the spring of 1901, I find :

1st. That *Hyphantria Cunea* varies in both sexes from heavily spotted to absolutely immaculate.

2nd. That *Hyphantria Textor* is invariably immaculate.

3rd. That the two forms differ markedly and constantly in the larval state, while *Cunea* especially varies within its own range.

4th. That the two forms will not mate.

5th. That, other things being equal, the spring brood of *Cunea* is more heavily marked than the summer brood.

6th. That in the north *Cunea* tends to become a single brooded, heavily marked form.

I therefore contend that my results prove beyond reasonable doubt that we have two valid species, though in the imago stage it is impossible to distinguish between an immaculate *Cunea* and a *Textor*, and that the name given by Harris should therefore be restored to full specific rank.

Now, as to the synonymy, in Neumoegen & Dyar's "Preliminary Revision,"* the name Var. *Budea* Hübner was used for *Textor*, but this reference was evidently founded on a misapprehension as Hubner's figure shows a moth with a single dot on each fore wing, exactly as in fig. 14 of my plate, and the description mentions this spot, as I am now informed by Dr. Dyar.

*Journal N. Y. Ent. Soc. I. 178.

The species should therefore stand as follows:

HYPHANTRIA. Harris.

CUNEA, Drury. (*Bombyx*).

Punctatissima, Abbot & Smith. (*Phalæna*).

Budea, Hübner. (*Cycnia*).

Mutans, Walker. (*Spilosoma*).

Punctata, Fitch. (*Hyphantria*).

Ab. var. Pallida, Packard. (*Arctia*).

TEXTOR, Harris. (*Arctia*).

? *Candida*, Walker. (*Spilosoma*).

I have referred *Candida* Walker doubtfully as a synonym of *Textor*, as it is impossible to be sure that the type was not merely an immaculate *Cunea*, unless it could be shown to have come from a locality where *Textor* occurs and *Cunea* does not.

Figure 12 on the plate is shown as agreeing with almost absolute exactness with Drury's figure of *Cunea*, and Figure 23 as the nearest specimen to the very aberrant type of *Arctia Pallida* Pack. which I have been able to obtain. Sir George Hampson, in Vol. III of his work on the moths of the world, refers to Hyphantria the species described by Grote as *Alericles Aspersa*, but as he admits the species is unknown to him, I consider the reference at least doubtful.

In the following summary I have endeavored to classify the individuals of the different broods, but any such classification is artificial, and merely approximate, as they merge by the slightest possible gradations from one extreme to the other.

SUMMARY.

Brood.	No. 1.	A.		B.		Dyar's.
Emerged.	Spring.	Summer.	Spring.	Summer.	Spring.	Spring.
Heavily Spotted						
♂	7		5			
♀	3					
Well Spotted						
♂	14		14		1	
♀	13					
Lightly Spotted						
♂	2		21	3		
♀	9		1			
Traces of Spots						
♂	0	5	9	9		10
♀	7	0	6			
Immaculate						
♂	0	6	12	21		14
♀	4	6	45	17	2	22

Before concluding, I desire to acknowledge the kindness of Dr. Dyar, not only in supplying me with the necessary eggs and larvæ of *Cunea*, but also in carrying on similar experiments at Washington, breeding over 600 moths, the results of which I am permitted to give in the annexed Appendix, and which tend to confirm my conclusions.

I may also say that I learned through Dr. Dyar that Mr. Theodore Pergande had, from his own observations, become convinced that there were two species, the one varying from spotted to white, and the other always white, but differing in the larval state, just as my experiments have shown that they do.

To be the means of proving the correctness of a name given by Dr. Harris, for whom I have such a profound respect, is a source of gratification.

EXPLANATION OF PLATE.—(See frontispiece).

No. 1. ♀ parent of brood No. 1.

No. 2-6. ♂ ♂ brood No. 1 emerged March-May, 1900.

No. 7-11. ♀ ♀ brood No. 1. emerged March-April, 1900.

No. 12. ♂ from N. J. as close as possible to Drury's figure.

No. 13-15. ♂ ♂ brood A. emerged July-August, 1900.

No. 16. ♀ " " "

No. 17 20. ♂ ♂ " " May, 1901,

No. 21-22. ♀ ♀ " " " "

No. 23. ♂ similar to Packard's *Arctia Pallida*.

No 24-26. ♂ ♂ brood B emerged end July, 1900.

No. 27. ♀ " " 5th August 1900.

No. 28. ♂ " " May 1901.

No. 29-31. ♂ ♂ Dyar's brood emerged May, 1901.

No. 32-33. ♀ ♀ " " emerged May, 1901.

APPENDIX.

Results obtained at Washington, by Dr. H. G. Dyar in carrying on parallel experiments 1900-1901.

SUMMER MOTHS.

Brood

D 1* Eggs on sycamore, Washington, D. C., June 1, 1900. No moths.

D 2* On pear, Hollydale, Pa., May 24th, 1900. Bred at Washington, D. C., 23 moths (13 ♂ 10 ♀) white, 4 ♂ with traces of spots.

D 3* On Sycamore, Washington, D. C., June 1, 1900. 36 moths in July-August (19 ♂ 17 ♀) white, 3 ♂ slightly, 1 ♂ distinctly spotted.

D 4* On Sycamore, Washington, D. C., in stage II, May 29, 1900. Moths in August, 90 moths (43 ♂ 47 ♀) white, 3 ♂ with traces of spots.

D 5* On Sycamore, Washington, D.C., June 1, 1900. Moths in August, 4 moths (1 ♂ 3 ♀) white.

D 6* On Sycamore, Washington, D. C., June 1, 1900. Moths in August, 145 moths (77 ♂ 68 ♀) white, 3 ♂ with traces of spots.

D 7* Eggs from ♀ on Sycamore, Washington, D. C., hatched June 11, other broods in stages III and IV at the time. Moths in August, 204 moths (103 ♂ 101 ♀) white, 6 ♂ with faint grayish spots.

D 8* On Mulberry, Montreal, Ga., (J. H. Heard), June 8, 1900. Moths in August, 7 ♀ white.

SPRING MOTHS.

D 9* Mating of moths of D 4 end of July, 1900, Moth 1 ♀ white April 24th 1901.

D 10* Mating of moths of D 7 August, 1900. Moths March 24–May 2, 1901, 28 moths (11 ♂ 17 ♀) ♂ all lightly spotted, ♀ all white.

D 11 Brood of H, Textor from H. H. L., Montreal, no moths.

D 12* Anothing mating of D 4 end of July, 1900, Moths March 28–May 4, 1901, 20 moths (5 ♂ 15 ♀) most of them spotted, none heavily, but 1 ♂ 5 ♀ white.

D 13* A mating of Mr. Lyman's broods A and B sent from Washington 30th May, 1900, and the larvæ of brood AB returned to Washington. Moths March 24–May 1, 1901, 46 moths (42 ♂ 4 ♀) Spotted, some heavily, 3 ♂ and 3 ♀ white.

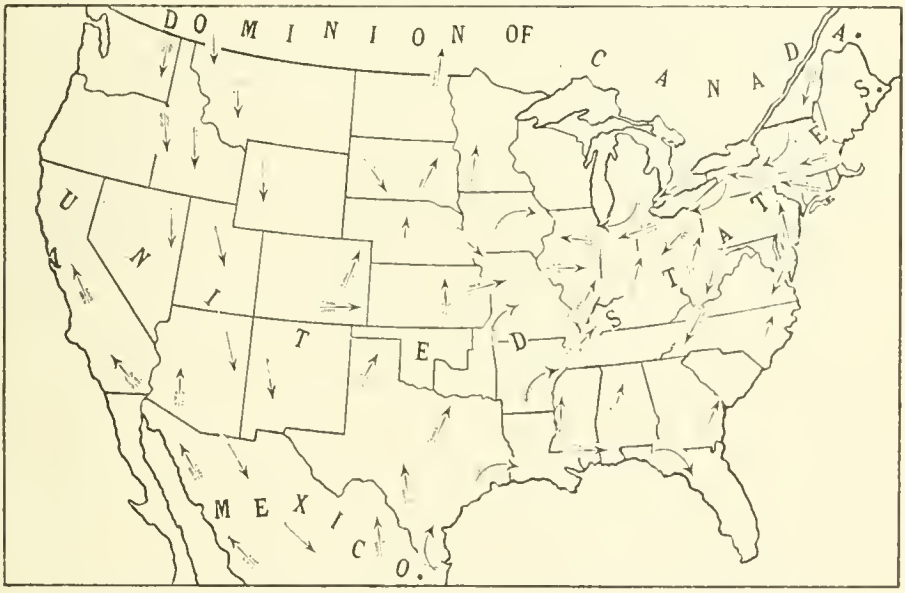
*Larvæ of *Cunea* type.

THE TREND OF INSECT DIFFUSION IN NORTH AMERICA.

By F. M. Webster, Wooster, O.

American entomologists have for many years been engaged in observing, defining and recording the distribution of species of insects and their progress, if of a migratory nature. In earlier days, when entomologists were few in number and widely scattered, there was little opportunity for serial observations or combined studies. But now, with entomologists in every State, the distribution of species can be more thoroughly studied and their movements, if such occur, carefully traced across State after State with surprising promptness and accuracy.

While it is not the object of this paper to gather up all the facts bearing on this subject that are scattered through our literature, it does seem proper, at this time, to sketch, tentatively at least the possible if not probable paths along which some insects, once unknown, but now common, have made their way to their present areas of habitation.



Map 1.—The Trend of Insect Diffusion in North America.—Webster.

Acquisitions to our insect fauna have come to us, almost exclusively from two sources, viz., either by introduction amongst articles of commerce or through natural influences, in the latter cases coming either from the north or the south, generally the latter.

The Appalachian mountain system on the east and the Cordilleran mountain system on the west, while they do not prevent the introduction of foreign insects along our sea coasts, they do present more or less impassable barriers to the direct progress of such insects inland. In the case of the Cordilleras these appear to separate the northward flowing stream of tropical and sub tropical species in its onward course, sending one portion along the Pacific coast and the other along the coast of the Gulf of Mexico, the latter sometimes spreading broadly inland, while the former holds more closely to the coast. The influence of the high plateau in Mexico on the eastern branch of this insect stream, will, some day, offer material for a most interesting study, even if it does not solve the problem of the evolution of several of our common insects. The Appalachian system does not approach the gulf coast at its southern terminus, but leaves a broad avenue that enables species moving eastward to pass on along the gulf to the Atlantic coast and thence northward. It does, however, to the northward form an almost impassable

obstruction to the directly westward migration of insects from east to west, broken only in the State of New York and the country adjacent to the north and south shores of Lake Erie. Here we have a huge gateway through which nearly or quite all species imported from Europe, landing on our eastern seacoast, north of the mouth of the Potomac river at least, make their way into the comparatively level country beyond It is barely possible that the valley of the Big Kanawka river in West Virginia and Cumberland Gap may offer passage ways for an occasional species, but of this we have no proof as yet. In the Cordilleran system there do not appear to be any such openings or gaps for the outflowing and spread of migrating species, except, perhaps, in extreme southern California and Arizona, a country so arid that few species can take advantage thereof, if it really exists, hence, a separation in South or Central America usually remains permanent, while in the case of the Appalachians, a species may work its way south along the Atlantic coast to the Gulf, and in a comparatively short time mingle with the northern branch that has made its way west to the great lakes and thence southward.

Besides these, there are paths of migration from the north southward, but these are confined to the two mountain systems now under discussion.

I will now take up each of these paths or trails of migration and give a few illustrations to make my points more intelligible. (See Map 1.)

The imported cabbage butterfly, *Pieris rapæ*, as is well known, was first observed in the vicinity of Quebec in 1860. From here it gradually spread south into New England and west through New York, so that it actually invaded Canada from the United States in 1872, and a year later, *in the spring of 1873*, it appeared at Cleveland, Ohio, in limited numbers.[1]

Many years ago one of the Dung beetles, *Aphodius fossor* L., which occurs in Europe, was introduced into the same section of country as the preceding, and like it spread southward into New England, and is now only being found occasionally in northeastern Ohio, though it was included in the list of Lake Superior species in 1878 by Hubbard and Schwarz, but not in the 1880 list of Reinecke and Zesch of species found within 15 miles of Buffalo, New York. In this case it evidently spread faster through Canada, but came to Ohio by the way of western New York.

The Asparagus beetle, *Crioceris asparagi*, introduced from Europe many years ago, first appeared in Ohio in the northeastern portion of the state, precisely as it made its way into Canada by way of western New York. *Crioceris 12-punctatus* has not yet been found in the State of Ohio but is to be expected within a year or two.

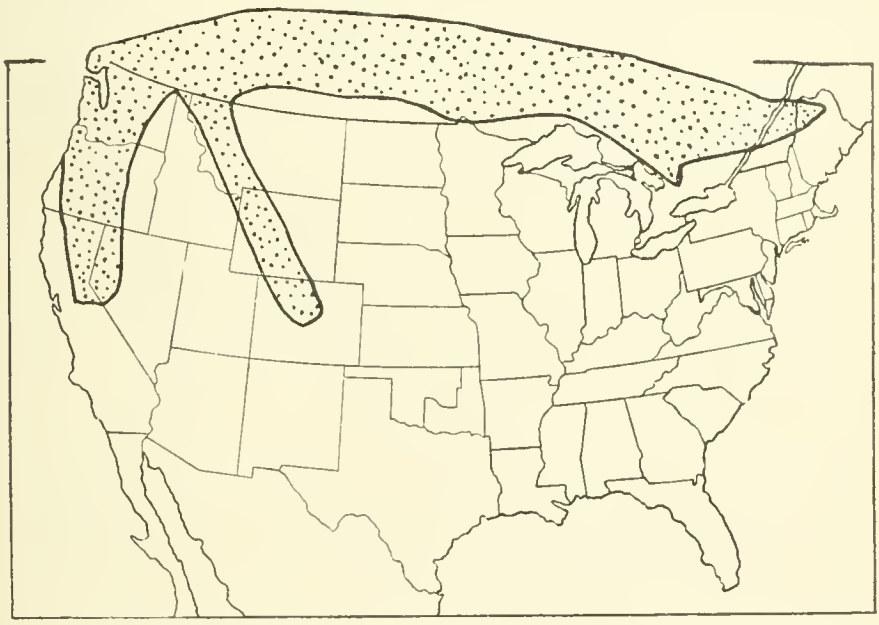
The clover leaf weevil, *Phytonomus punctatus*, and the clover root borer, *Hylastes obscurus*, both imported from Europe and both first coming to notice in western central New York, were first reported in Ohio in the northeastern counties. It is true that a single specimen of the former was taken from the *crop of a crow shot in Michigan in 1892.*[2] Yet had it invaded the State of Ohio from that direction the fact would have been shown by its presence in the clover fields of the farmer. I found it abundantly at Chautauqua Lake, New York, in August, 1888, and it must have entered Ohio a year, or at most two, afterwards. It is true that Mr. Dury found it near Cincinnati in 1892 and Mr. Hine in Lucas County the following year, but it did not become noticeaoly abundant until long after the farmers in northeastern Ohio were complaining of its attacking clover. The *Hylastes* also was found about Cincinnati soon after its appearance in northeastern Ohio, but like the *Phytonomus* it was probably carried into some of the tributaries of the Ohio river, possibly in northeastern Ohio, during the high waters of spring and down stream, being left by the receding water with driftwood and other debris, far back among the cultivated lands along the river itself.

[1]Scudder The introduction and spread of *Pieris rapæ* in North America, 1860-1885. Mem. Bos. Soc. Nat. Hist. Vol. IV, No. III.

[2]*The Common Crow of the U.S., Burrows and Schwarz*: Bull. 6, U. S. Dep. Agr. Div. Ornithology and Mammology.

Even the Horn Fly, *Hæmatobia serrata*, was first reported in the State at a point some thirty miles east of Cleveland, though it appeared elsewhere soon after, and now we have another illustration in the Willow and Poplar Curculio, *Cryptorhynchus lapathi*, found at Ashtabula in the extreme northeastern county within a few weeks. This last appeared about Buffalo, New York, in 1896.

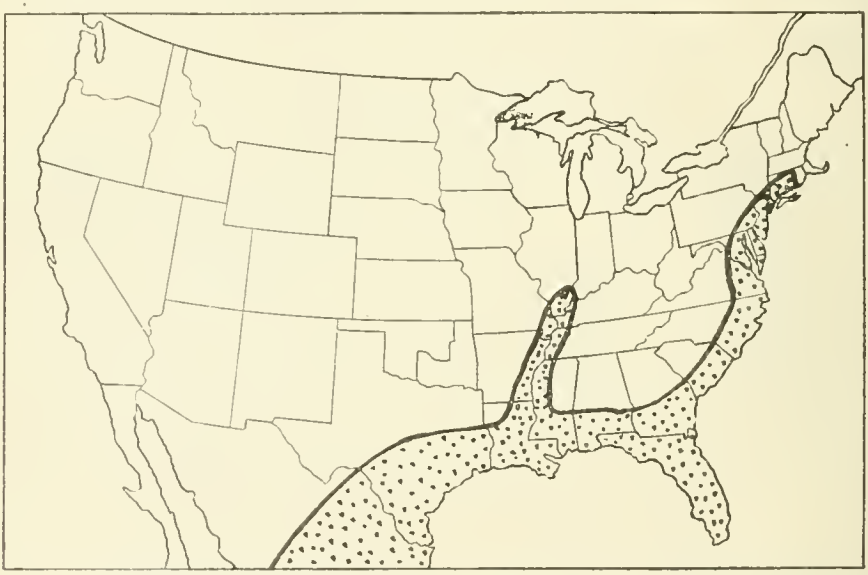
The foregoing illustrations will, I think, show clearly that there is a gateway opening into Canada between the east end of Lake Erie and the western end of Lake Ontario as wide as the Niagara River is long, through which insects introduced from Europe make their way, frequently even when such have been first introduced into Quebec, seemingly preferring to make their way westward to the south of Lake Ontario instead of to the north of it. The gateway on the United States side is along the south shore of Lake Erie, and between it and the northern terminus of the Alleghany mountains.



MAP 2.—The dotted area shows territory over which *Erynnis Manitoba*, the Canadian Skipper Butterfly, occurs and illustrates the southern trend of northern species. (Adapted from Scudder.)

The eastward trend of insect migration is followed, either by species whose native habitat is along the foothills of the Rocky Mountains, or else by such as have come up from the far south and swayed broadly to the eastward across northern Missouri, Iowa and possibly southern Minnesota. The spread of the Colorado Potato beetle, *Doryphora 10-lineata*, is a good illustration, while the Box Alder bug, *Leptocoris trivittatus*, which is slowly but surely making its way eastward, having, as Dr. Forbes informs me, reached eastern Illinois, is another example. Of those that have come up from the far south and fallen into this trend of migration, probably *Diabrotica longicornis* will offer the best illustration, and this will lead me to the discussion of the northward spread of tropical and sub-tropical species. This species was first observed along the eastern slope of the Rocky Mountains, and up to within the last thirty-five years was a comparatively rare insect, found in summer on the blossoms of golden-rod and thistles, and probably occurred, locally, far to the eastward, possibly reaching the Atlantic coast within the last twenty-five years. The writer can well remember when it was of uncommon occurrence in northern Illinois, where now it literally swarms, under certain conditions of Indian corn

culture, to which crop it has come to be a veritable pest. Somewhere in the great corn fields of Illinois and perhaps Iowa, this insect acquired the habit of breeding in the roots of corn, and what seems to be a corn feeding race has sprung up and has slowly made its way eastward, having now reached the eastern half of Ohio. As illustrating this feature of its diffusion, while I have been closely watching its progress in western Ohio, I was unable for ten years to find a single individual about Wooster, situated about 65 miles from the eastern line of the State, and about 35 miles from Lake Erie. In the summer of 1900, however, I found a single individual in my garden on the common sunflower, and, judging from past experience in other States as well as in western Ohio, we shall soon have the insect in abundance. Elsewhere* I have discussed



Map 3.—The dotted area shows the territory over which *Lerema accius*, the Clouded Skipper Butterfly, occurs. This is the area covered by the northern trend of southern species. (Adapted from Scudder.)

the diffusion of the genus at considerable length, and it is unnecessary to repeat here what was there stated, except to again call attention to the fact that our *D. vittata* has a very close relative in *D. trivittata* on the Pacific coast and that our *D. 12-punctata* has an equally near relative in the *D. soror*, also of the Pacific coast, while each has an intermediate species that seems to connect the two in each case. This phenomenon I attribute to the fact that the original stem species may have become separated far to the south, and one branch followed the western slope and the other the eastern, Prof. Cockerell's *D. vittata* var., *incerta* coming between the former and *D. trivittata*, would seem to give us an illustration of an intermediate species in the process of evolution, while in *D. tricincta*, which occupies a similar relation to *D. 12-punctata* and *D. soror*, the evolution has advanced further and we have what we term a good species. From some more recent studies of *Myochrous denticollis* and allied species of that genus, it would seem that something similar might have taken place with reference to that species as well†.

The southern terminus of the Appalachian system has a similar effect in dividing the streams of insect migration, after such have passed to the eastward along the gulf coast, one branch keeping along the Atlantic coast and the other to the west of the mountains, but without any such influences on the species as seemingly occurs in Central America and Mexico. Thus, there

*Jour. N. Y. Ent. Soc., Vol. III, pp. 158-166 ; Vol. IV, p. 67.

†Loc. Cit., Vol. IX, p. 127.

is no perceivable difference between the *Dynastes tityus* that breeds in the southern portions of Illinois, Indiana and Ohio, and those found some distance up the Hudson River in New York. The same is also true of the Bag Worm, *Thyridopteryx ephemeraformis*, which along the sea coast extends northward to Massachusetts, and in the west it has been sent me from within twenty-five miles of Lake Erie, though it is but fair to say that this was in case of a single sack, the species not occuring abundantly north of Columbus, in this State, and, until quite recently, it was not to be found even that far north, yet there is no apparent difference between Ohio and Massachusetts specimens, so far as I have been able to learn. The chinch bug, *Blissus leucopterus*, may, perhaps seem to offer an exception in its abbreviated wings along the shores of the Atlantic, but as we have the same phenomenon in the same species on the Pacific coast, it would seem that it is due to maritime influences. If one will take almost any study of the distribution of our species of insects and examine it closely, he will be surprised at the number that extend their habitat south into Central and South America, and will get the impression that many of our species really extend from the tropical countries northward, instead of from north to south, as it is usually given by our systematists. A good illustration is afforded by a recent "Review of the Tettigonidæ of north America, north of Mexico," by Mr. Elmer D. Ball, who, after the common usage, gives the species as occuring from its northernmost known home south when in the cases of 19 out of 26 species considered, this statement should have been reversed. These illustrations only convey a limited idea of the wealth of material awaiting the student of the origin of our insect fauna.

There remains only one more tide of insect migration to consider and *that from the north* to the southward. Mr. Schwarz* has given two exceedingly good illustrations of this, one, *Aphodius rufipes*, which occurs all over Europe and Siberia, but in North America only in the Alleghany mountains; the other a Carabid, *Nomius pygmæus*, which is found in Oregon and Washington, Lake Superior, Ottawa, Canada, Nova Scotia, and on the high mountains of North Carolina. Our commonest lady beetle, *Megilla maculata*, is found as far south as Chili, though at sea level, a large and developed variety occuring in the *Amazon district* of South America.† Our *Pyrameis huntera* has also been taken in Peru, at an altitude of 9,800 feet above the sea. The White Mountain Butterfly, *Œneis semidea*, as is well known, occurs in the White Mountains of New Hampshire, Labrador, and on the high mountains of Colorado. There are other equally interesting illustrations of this southward trend of arctic and boreal species, but I have not time to enumerate them. I will close this paper, however, by a significant statement made by Dr. Henry Skinner in the *Canadian Entomologist* of October, 1893, as follows: "In the species that fly from the Atlantic to the Pacific, and also exist in Europe, it will be found that the Pacific coast examples far more closely resemble European ones than those individuals found on the Atlantic slope."

THE IMPORTED WILLOW AND POPLAR CURCULIO.

Cryptorhynchus lapathi Linn.

By F. M. Webster.

My reason for treating this insect at considerable length at this time is, that it has passed the Alleghany Mountains and entered the middle west, having been found the present autumn near Ashtabula, in the extreme northeastern Ohio, by one of my assistants, Mr. A. F. Burgess, acting under my direction. Previous experience with imported insects that have made their way to the west, led me to believe that we should sooner or later find it in Ohio, and that it

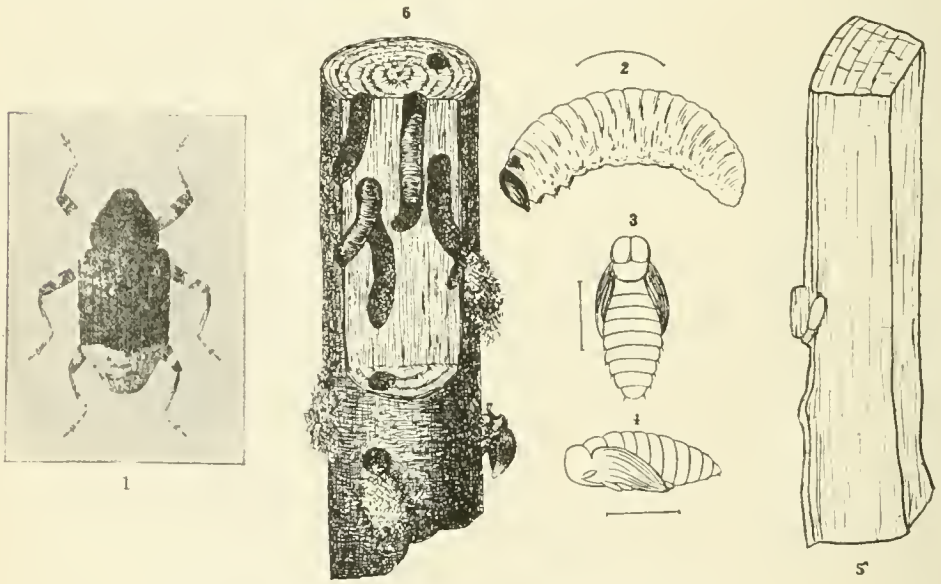
* Proc. Ent. Soc., Washington, Vol. I,. p. 186.

† Travels Among the great Andes of the Equator, Appendix, p. 57.

would first appear in that part of the State, therefore Mr. Burgess was instructed to search for it this fall as opportunity offered, and a single female was found in the act of ovipositing on Oct. 5th, in willow, growing along a small stream just east of the City of Ashtabula.

Description of the Mature Insect.

The insect is one of the snout beetles or curculios, related to the plum curculio, but much larger, being from 6.5 to 7.5 mm., about one-third to three-eighths of an inch, in length ; body dull black with little spots or tufts of jet-black scales or hairs on the thorax and wing covers ; scattered over the forward half of the wing covers are minute white scales which almost cover the posterior third, and form a somewhat V-shaped marking between this and the thorax. The body is coarsely pitted, and the femora, or first joints of the legs are spined. Plate, Fig. 1.



The Imported Willow and Pop'ar Curculio.—(Webster.)

Figure 1, *Cryptorhynchus lapathi*, adult, enlarged. Original.
Figure 2, larva ; figures 3 and 4, pupa. After Jack.
Figure 5, egg enlarged, as placed by female in bark of willow. Original.
Figure 6, illustrating larvae burrowing in the solid wood. After Jack.

Description of the Larvæ or Young.

When fully developed these are fleshy, footless, whitish borers, having somewhat the appearance of grubs, with small brown heads and darker brown jaws. Plate, Fig. 2.

Distribution of the Species.

The insect is common in Europe, ranging over Siberia and Japan, but whether it extends further south into Central Asia is not known. In the United States it is known to occur from New Jersey to Massachusetts, and westward through New York and in north-eastern Ohio, having without doubt pushed its way along the south shores of Lake Erie, from Buffalo, N.Y , where it was first observed in the summer of 1896.

History of the Species in Other Lands.

The species was described by Linnæus in his "Systema Naturæ," in 1763, its habitat being given as Europe, and found on *Salix* and *Rumex*, willow and dock. Later, it received attention from Fabricius in his "Systema eleuteratarum, 1801; Syst. Entomologia, 1775; Spec. Insectorum, 1781; Entom. Systematica, 1792," and later by Zetterstedt, Mathieu and Kaltenbach. It is included in Turton's Linnæus, 1806, Vol. II., p. 231. Ratzeburg, in his "Die Forst-Insecten," 1839, p. 155, briefly characterizes the insect, and states that it takes its name from the large-leaved dock, Lapathum, of the ancients, on which it sometimes sits. In Silesia it is called the alder destroyer (Erlenwurger). In July, 1824, in the vicinity of Liegnitz, a whole alder plantation was destroyed by it, and even a large number of trees ready for cutting did not escape. Willows were also destroyed by it. Nordlinger, in "Nachtrage zu Ratzeburg's Forstinsekten," 1856, p. 15, says that, according to Herr Suffrian, it occurred on low willows four or five feet high at the bases of the branches, and also on these last, and in June and July it was found in great numbers at Hohenheim on Canadian poplars, and also on white willows, where it would remain for hours with its snout buried in the spongy linticels.

Herr Hahn, wood commissioner of the district of Laupheim, observed in the forest of Ochsenhauser, on a strip of land on which both deciduous and coniferous trees were growing, that the birches five to eight feet high were broken off about three feet below the top, and were hanging down. One inch below the break was a worm-hole filled with worm-dust and wood shavings, in each of which was found a yellowish white larva with a brown head, which, after from eight to fourteen days, developed into one of these curculios. Herr Hahn considered that in this case the insect had destroyed the growth of two years.

In 1867, Brehm and Rossmassler, in "Die Thiere des Waldes," Bd. II., p. 171, under the term "Der Erlenrusselkafer," state that they have only noticed the insect in the mountain region, where it constantly works on the white alder, *Alnus incana* L., hardly a bush along the brooks and forest borders being free from the pest, the branches and trunks attacked readily breaking off.

In 1868, Ratzeburg again takes up the species in his "Die Waldverderbniss," dealing with it much more thoroughly than he had been able to do in his previous writings, and calling attention to the observations of Zebe and Herr V. Kamptz, relative to the injuries done by the insect, the latter having observed the habits of the beetle in Mecklenberg-Strelitz for many years. He states that an annual generation is the rule, and hibernation, therefore, occurs in all stages, most seldom in the larval state. The point that the beetle prefers isolated trees and does not like a wet locality well, is repeated, but he is still reluctant in classing the black alder as a common food plant, though not doubting that it is one of the food plants. In 1869, in "Die Waldverderber," pp. 171, 172, he states that the eggs are laid in May, the normal season, usually on alders—the black rather than the white—much more rarely on poplars, birches and willows, and the beetle prefers the young shoots or branches two to three years old. He is seemingly much perplexed over the fact that, while the beetles pair and the females oviposit normally in May, they were also abundant in August.

In 1881, Dr. Bernard Altum, in "Forstzoologie," III. Bd. abth., p. 220, opens his discussion of the species by the interesting statement that there are 221 species of the genus *Cryptorhynchus*, distributed over the entire earth, while Taschenberg, in "Brehm's Tierleben Insekten," 9 Bd., p. 163, 1892, states that *C. lapathi* is the only European representative of a South American genus. I may add here that we have now 16 species inhabiting North America, north of Mexico, the majority of them inhabiting the southern or south-western States. Dr. Altum wrestles with the life history, and does not clear up the obscurity, but states that while the sexes pair and oviposit in May, they may be observed pairing in September, there being a noticeable falling off in point of numbers during July. He leaves the subject by allow-

ing a two year generation; that is, covering a portion of two calendar years, but completing their life cycle within twelve months.

The life history is given as follows, as observed in Silesia. Here, again, the white alder was seemingly preferred. The larva first works flatways under the bark, and then goes straight, ascending into the wood. Fig. 6, Plate. The larva makes the first chamber under the bark the first summer, and af er hibernation begins to excavate its gallery into the sound wood, ascending as a steep passage—sometimes as a broken one—still directly into the sap-wood, and before pupating the larva reverses its position and lies with its head downward in the burrow. Besides the white alder *Alnus incana*, black alder *A. glutinosa*, and of the willows, *Salix purpura*, *S. viminalis* and *S. triandra* are given as food plants, coupled with the statement that the willows along the railroads were badly injured, and in many places entirely destroyed by the ravages of this insect.

Judeich and Nitsche, in "Lehrbuch der Mitteleuropaischen Forstinsektenkunde," II. Abtheilung, 1889, deal at length with the insect, but do not clear up the obscurity in its life history, viz., do the beetles emerging in the fall come from eggs laid in the spring of the same year, or from those laid the preceding year? The eggs are, for the most part, deposited singly in the bark of young alders, both black and white, and willows, including, besides those previously mentioned, *Salix cuprea*, and the larvæ eating out a hollow space under the bark, later force their way upward and deep into the wood. In case of small growths they work only in the centre. Before pupation the larva turns head downwards and prefers to hibernate in the larval chamber, climbing down the chamber when ready to emerge, and eating out a round hole in the bark for exit, near the place where the larval injury began. In proof that the beetles do not hibernate outside, the observations of Taschenberg are cited, who observes that where its dwelling-places about Halle were flooded during the winter, it was never to be found among the floating reeds and underbrush.

Eckstein, in "Zeitschrift fur Forst-und Jagdwdsen," XXIII,, Bd 1891, p. 378, states that single willows in the forest botanical garden were attacked by this insect and badly injured. He also calls attention to the fact that, in badly infested stems, the larvæ frequently take a descending course instead of an ascending one, and also that the beetle does not gnaw a separate exit after leaving the pupal chamber, but follows the larval gallery, and makes its exit through openings made by external agencies.

Taschenberg, "Brehm's Tierleben, Insekten," 9 Bd., p. 163, 1892, states that on the banks of the Saal, near Halle, the larvæ live in the old gnarled root-stocks of the basket willows, causing these to die gradually, earlier than they would otherwise have done, and that in alder nurseries the larvæ do serious damage, and that they destroy plantations of young birch. Tubeuf, in "Forstlich-Naturwissenschaftliche Zeitschrift," I. Jahrgang, p. 387, adds the Alpine alder, *Alnus viridis*, to the list of food plants of the species, and finds fully developed beetles in the burrows in September, where the weather is cold and it frequently snows during that month.

History of the Species in America.

The first published record of the occurrence of the insect in America is by William Juelich, in "Entomologica Americana," Vol. III., p. 123, 1887. Mr. Juelich, early in June of that year, took a section of willow that had been blown down near West Bergen, New Jersey, and from it on July 3rd there emerged two adults, and later he succeeded in getting ten more from pieces of the same willow. He states also that he had, five years before (1882), collected a single specimen on willow near Williamsbridge, about twelve miles from where he secured his pieces of willow from which he reared the later specimens, and also that Mr. Ottomar Dietz had taken a specimen on Staten Island. From the pieces of willow Mr. Juelich also reared three specimens of an Ichneumon, *Ephialtes irritator* Fab., and, as no trace of other insects inhabitating the

pieces of willow could be found, it was presumed that the Ichneumon was a parasite on the beetle. In the "Canadian Entomologist," Vol. XXIII., p. 221, 1891, Prof. John B. Smith stated that nearly all of the clumps of willows near Arlington and Newark, New Jersey, and also some fancy garden trees had been killed by the insect. The next published notice is by myself in "Journal of the New York Entomological Society," Vol. V., p. 30, March, 1897. In company with Mr. Ottomar Reinecke, of Buffalo, I had, on August 24th of the preceding year, taken the insect in considerable numbers near that city, where it had only just been discovered by Mr. Reinecke. Dr. A. D. Hopkins, of Morgantown, W. Va., also accompanied us, and larvæ (Plate, fig. 2), pupæ (figs. 3 and 4) and adults (fig. 1) were all secured. My beetles were collected in a cyanide bottle, strongly charged and freshly made. The beetles remained in this bottle some six or seven hours, when they were removed and placed in small tin boxes. The following morning, the 25th, they gave no signs of life, but after I had returned home, on the 29th, not only were all of them found alive when I opened the box, but several of them were pairing. They were then placed on willow, but, though they did a large amount of puncturing, and would remain for hours with their snouts embedded in the bark, as has been observed in Europe, I was not able to secure a single egg, though some of the beetles survived until early in November (loc. cit., p. 204).

The next contribution to American literature relative to the pest, is by Mr. J. G. Jack, of the Arnold Arboretum, in "Garden and Forest," Vol. X , p. 394, October, 1897. Mr. Jack states that the insect had been known about Boston and Cambridge, Massachusetts, for many years, and for several years had been destructive to almost all species of willows growing in the Arboretum. It had been found burrowing in nearly all of the native willows except a few mountain or very slender stemed species, too small to afford sufficient tissue in which to excavate their chambers or feed freely. (Plate fig. 6.) Of the foreign species of willows, the white willow, cracked willow and laurel leaved willow, were all affected, but less seriously than the Babylonian weeping willow. All of the species of poplar in the Arboretum, particularly while young, had been attacked, and to a less extent the dwarf birch, *Betula pumila*, and the Red River birch, *B. nigra*. So abundant was the pest, and so extensive its ravages, that it was hardly possible to find a good healthy plant among the scrubby willows about Boston. The beetles were found on the bark, and sometimes on the foliage, in July and August. Other information is given, taken from European authors.

In "Psyche," Vol. VIII., p. 371, June, 1899, Mr. A. H. Kirkland calls attention to the fact that, about some of the shore towns in eastern Massachusetts, this insect has become a serious enemy to the Balm of Gilead trees, which, on account of the somewhat marshy land, constituted by far the most common shade tree, and so great was the injury that at that time it was almost impossible to find a sound tree of this species, all having been weakened by the attacks of this borer, and later broken down by the ice storms and high gales. Serious damage in nurseries is also recorded. Mr. Kirkland began in June, 1897, a study of the life history of the species in this country, and as he has very kindly placed his notes in my hands for use in the preparation of this paper, I take pleasure not only in appending them herewith, but in thanking him most heartily for allowing me to use them. I am also further indebted to Mr. Kirkland for translations of the European authors from which I have so freely drawn. The notes just mentioned are as follows :—

June 30, 1897. Larvae abundant at Winthrop, Massachusetts, boring in Balm of Gilead trees ; larvae nearly full grown, and some forming cells to pupate. Before pupating they enlarge their burrows to the outlet, then retreat to the upper end and transform in a neat chamber. 57 larvae taken from a stick 1½ inches in diameter, and 2 feet long.

July 3, 1897. Larvae common at Saugus, Massachusetts, in our native trembling poplar.

July 4, 1897.	Many small beetles (*Ips fasciatus* and its allies) abundant in filth which oozes from the burrows.
July 14, 1897.	From the middle of June to the middle of July sap flows freely from exits of burrows. Pupa always headed towards exit. Large infested branches wilt and die.
July 22, 1897.	In infested branches taken June 30th, beetles are matured to-day. I split open branches every day from June 30th on, and found nearly all the larvae pupated July 3rd and 4th. Eighteen days will pretty closely cover the length of pupal stage.
July 28, 1897.	Plenty of beetles in the infested sticks and only one pupa found. But few of the beetles have emerged from the burrows as yet.
July 31, 1897.	Beetles emerging freely.
August 17, 1897.	Beetles common. Feeding on petioles and poplar leaves.
May 22, 1898.	Captured one imago at Medford. Probably an over-wintered specimen.
May 29, 1898.	Found plenty of larvae in native willows at Medford. This shows that the insect breeds in our woodlands
June 6, 1898.	Larvae are feeding rapidly and throwing out worm-dust from their burrows.
June 15, 1898.	Larvae boring in *Populus monilifera*, at Bedford, Massachusetts.
June 27, 1898.	Larvae nearly full grown.
July 5, 1898	Beetles mating at Medford.
July 10, 1898.	Larvae beginning to pupate, the date being later than last year. The small larvae hibernate in the cambium, enter the wood in the spring, and make a rapid growth to maturity. The base of young trees is a favorite point of attack ; older trees are more difficult to affect.
July 16, 1898.	Found larvae boring in silver poplar (*Boliana poplar*).
July 30, 1898.	Beetles abundant at Springfield, Massachusetts, along the Connecticut River ; feeding on the cotton wood.
September 15, 1898.	Imagoes mating at Malden.
September 21, 1898.	Beetles abundant and feeding on petioles and young twigs, at Winthrop, Massachusetts.
April 5, 1899.	Found minute larvae under leaf scars in poplars at Abington, Massachusetts. Larvae $\frac{1}{16}$th of an inch long, curved, pale greenish, and only slightly active.
May 10, 1899.	Young larvae abundant in bark beneath leaf scars on poplars at Winthrop. Burrows about one inch long now mainly in the bark, and full of black castings.
May 18, 1899.	Larvae now entering the wood, having finished feeding in the bark.
June 4, 1899.	Larvae 7 to 10 mm. long and feeding rapidly.
October 2, 1899.	Found eggs of this insect for the first time, in poplars, at Wyman's Nurseries at Abington. They were wedged in under the bark in cavities at the base of young branches. The beetle gouges out a hole for each egg, and leaves from one to four in a spot. In some of the infested sticks the eggs have hatched and the tiny larvae have commenced feeding. This finding of the eggs closes the gap in the life history of the insect.

Unless there are adults in spring, which, as in Europe, deposit eggs in May, and Mr. Kirkland overlooked these, which is hardly possible, he has given the full life history, for the first time. It is possible that the single annual brood is not, as seems to be the case in Europe, intercepted by winter. Certain it was that the insect was pairing at Buffalo, N. Y.,

August 24th, 1896, and ovipositing at Ashtabula, O., on October 5th, 1901, though in this latter case it might have been by a belated female. Mr. Burgess examined many poplars in the city of Ashtabula without finding the insect, and but a single female was to be found on the willows in a deep ravine near the city. This female was observed in the act of oviposition, the place selected by her being one of the corky growths, common on the willow bark. The day was cool, and the beetle worked on the south side of the tree, pushing her snout into the corky bark as far as it would extend, and worked it about so that quite a cavity was excavated. She was thus engaged when found, and continued to work for forty minutes. At the end of this time she reversed her position, and, placing her ovipositor in the cavity, forced it in the entire length, her position at the time being parallel to the ground. After remaining motionless for three minutes she began to move the abdomen and ovipositor upward and downward, and, though something could be observed passing into the cavity, whether the egg or some mucilaginous matter could not be determined, but in any case, when she had finished her work the cavity was completely closed. Turning about again she seemed to examine her work with snout and antenna, and, apparently satisfied therewith, she sought out another similar corky growth and began her work when she was captured, remaining alive, however, until October 10.h. The section of willow showing the egg as it was placed by the insect is shown by fig. 5, plate. It will be noticed that it was jammed into place, and probably packed securely with the surrounding tissue, reduced to pulp by the jaws of the beetle.

The egg is oval, pale yellowish white ; length, 1.5 mm.; width, 0.8 mm.

It would appear from the foregoing that this insect has come among us to attack our willows, poplars and probably some other shade and ornamental trees that are found in our parks, cemeteries and other public grounds, as well as along our streets ; also, that it is a nursery pest as well. The Carolina poplar, on account of its symmetrical form and rapid growth, has been very largely planted during the last ten years, and it remains to be seen what effect this foreign insect will have upon these, especially as Mr. Kirkland informs me that, at present, the species is a serious pest in nurseries where poplars and willows are propagated, and on low lands where these are the principal shade trees.

Prevention.

If, as now seems to be the case, the insects live over in the bark as very young larvae, it will be difficult to detect their presence until the next summer, so that burning infested trees in winter will be impracticable, as the presence of the borer will only show after the injury has been done and the culprit escaped. Something may be accomplished by burning in late spring such trees as are seen to be infested, thus destroying the pest before it develops and escapes. The outlook, however, is not encouraging in the matter of protecting trees from attack.

THE COMMON CHEESE MITE, TYROGLYPHUS SIRO, LIVING IN SPOROTRICHUM GLOBULIFERUM.

By F. M. Webster.

Since the year 1896 I have been distributing from one hundred to several thousand small boxes of this fungus each year to farmers in Ohio, to be used against the chinch bug, *Blissus leucopterus*.

In the preparation of this fungus for distribution, we have followed the more recent method of cultivating it in quantity on a base of sterilized beef broth and corn meal, but recently an unexpected difficulty has arisen in the shape of the ravages of the common cheese mite, which makes its way into the boxes of the prepared material, after it has been dried and put away for use, and reduces the contents of the boxes to powder, so that it is simply a crawling mass.

Curiously enough, despite the attack of these mites, one of my assistants, Mr. Newell, took a quantity of this mass of powdered meal and mites and with this was enabled to get a fine culture in a bottle of the sterilized meal and broth dough.

The mite attacks not only cheese but sugar, flour, cured hams, wool, seeds and many other articles of food and commerce. Evidently it is in this case the dough that attracts them, but as against them this species of entomogenous fungi is clearly harmless.

THE HIBERNATION OF INSECTS.

By Prof. W. Lochhead, Ontario Agricultural College.

A very puzzling question, yet a very important one, is frequently asked : "Why do some insects pass the winter as adults ; some as pupae ; some as larvae ; and others in the egg stage ?"

To answer this question the entire history of the development of insects would require to be known, for there seems to be but little doubt that the particular hibernation form is the visible expression of the influence of many factors, such as change of environment, nature and abundance of food, and change of habit. The question of hibernation is clearly closely associated with that of metamorphosis, and any intelligent discussion of hibernation must necessarily deal with the causes of metamorphosis. When this connection is realized, it is plain that in dealing with hibernation forms of insects we are dealing with one of the most difficult problems in biology. No attempt will be made here to solve the difficulty, but, perhaps, the presentation of a few facts regarding hibernation forms may be useful and interesting.

The members of the order *Orthoptera*, almost without exception, hibernate in the egg stage; the *Hemiptera* mainly in the egg, or adult condition ; the *Neuroptera* as larvae ; the *Lepidoptera* in the egg, larval, pupal, or adult condition ; the *Coleoptera* as pupae or adults ; the *Hymenoptera* as larvae or pupae ; the *Diptera* as larvae, pupae, or adults.

According to the foregoing, it would appear that the insects that pass through an incomplete metamorphosis have but one, or at most two, forms of hibernation, while the insects which pass through a complete metamorphosis have several forms of hibernation.

When we remember that the modifications in the stages of metamorphosis are modifications in the form and functions of organs in adaptation to a changed environment, it becomes evident that the insect may winter over in any one of the four stages. That stage will be chosen which will suffer least by the change of environment. For example, in those forms whose larval existence is spent in semi-liquid decomposing matter, it would be practically disastrous for them to remain as larvae, when intense cold sets in and changes the condition of the medium. They are more likely to survive as pupae, or adults, in a dry medium.

With reference to metamorphosis, insects are divided into the *Hemimetabola*, or those with an incomplete metamorphosis, and the *Holometabola*, or those with a complete metamorphosis. In the former there is a gradual change from the larva to the perfect insect, while in the latter the insects pass through a resting pupal stage.

With regard to the stages of development, some of them show better adaptation to hibernation than others, although it is impossible at present to explain why some butterflies winter over in the adult state and others in the chrysalis ; or why some flies winter over in the larval state, some in the pupal, and others in the adult.

Brief notes of the stages will be given here beginning with the Egg, dwelling chiefly on characters which enable the insect to hibernate.

The Eggs. Eggs of insects are protected by two coats or membranes, an inner *vitelline* membrane, and an outer *chorion*, composed of two layers. When eggs are laid in situations exposed to the weather and cold, the shell, or chorion, is very solid, and sometimes strengthened

by ribs and ridges. Within the coats of the egg are the yolk-mass and the germinal vesicle, which lies within the yolk-mass. The amount of yolk-mass is usually large, and it is claimed by Brauer that the eggs of insects which undergo incomplete metamorphosis contain relatively more yolk than those of insects with complete metamorphosis. As the germinal vesicle lies within the yolk, it is securely protected against changes of temperature and moisture, as the yolk is mainly composed of fat globules. The eggs of some insects possess remarkable vitality, such as those of the "Walking Stick," and Bittacus, which survive two or more years.

Naturally, then, we might expect to find some insects in all the Orders hibernating in the egg state. The following common forms winter as eggs :—

Plant-lice (*Aphididae*).
Tree-Hoopers (*Membracidae*).
Leaf-Hoppers (*Jassidae*).
Most Scale Insects (*Coccidae*).
Leaf-bugs (*Capsidae*).
Grass-hoppers (*Acrididae*).
Locusts (*Locustidae*).
Crickets (*Gryllidae*).
Walking-Sticks (*Phasmidae*).
Gipsy Moths (*Ocneria dispar*).
Fall Canker Worm (*Palaeacrita pometaria*).
Tussock Moth (*Orgyia leucostigma*).
Tent-Caterpillars (*Clisiocampa Americana*, and *C. disstria*) (fig. 33).

Fig. 33. Egg-cluster of Tent Caterpillar.

The Larvae. Insect larvae differ from the immature forms of other invertebrates in the possession of the systems of organs and the same number of segments in the head, thoax, and abdomen. When ready to pupate the larvae are always larger than the adults.

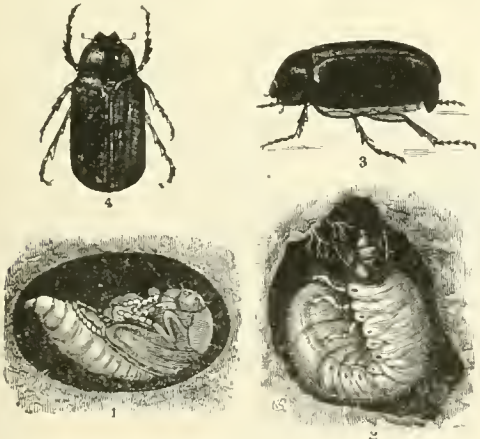


Fig. 36. Lachnosterna. 1. Pupa; 2. "White Grub": 3 and 4. Beetle.

Fig. 34. Cut-Worm.

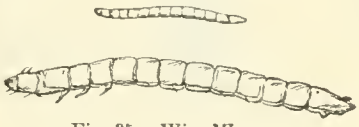


Fig. 35. Wire-Worms.

From the fact that the larval stage is the growing time of the insect it is not to be expected that hibernating larvae will often occur. Moreover, the relatively large amount of fluids within the body of the larvae, and the thin dermis just after moulting, make them extremely sensitive and liable to injury from freezing and other temperature changes.

Some insects, however, do hibernate as larvæ, but these are all protected in the ground, and in the mud at the bottom of ponds, or in specially constructed cocoons, or other covering. The following insects hibernate as larvæ :

Codling Worm (*Carpocapsa pomonella*)..
Bud-Moth Caterpillar (*Tmetocera ocellana*).
Most Cut-Worms (*Noctuidæ*), Fig 34.
Peach-Tree Borer (*Sannina exitiosa*).
Blister-Beetles (*Epicauta Pennsylvanica E. vittata, E. cinerea*).
Joint-Worms (*Isosoma tritici*).
Hessian Fly (*Cecidomyia destructor*). as "Flax-seed."
Ichneumon-Fly (*Ichneumonidæ*).
Ant-Lions (*Hemerobiidæ*).
Wire Worms (*Elateridæ*), Fig. 35.
White Grubs (*Lachnosterna fusca*)., Fig. 36.
San José Scale (*Aspidiotus perniciosus*).
Crambus Moth (*Crambidæ*).

The Pupa. True pupæ only occur among insects which undergo complete metamorphosis. As the pupal period is the resting, inactive stage, when no food is taken, and when the pupa

Fig. 38. Telea polyphemus cocoon.

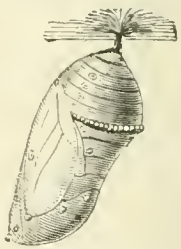


Fig. 41. Chrysalis of Milkweed Butterfly (Archippus).

Fig. 37. Attacus promethea cocoon.

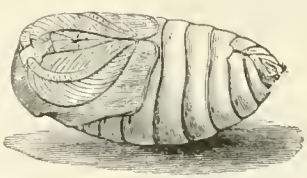


Fig. 39. Telea polyphemus chrysalis from interior of cocoon.

Fig. 42. Chrysalis of Papilio Cresphontes, showing mode of suspension.

itself is protected by a thick, chitinous, impervious coat, by a thickly-clad silk cocoon, or by an earthen cell in the ground, the majority of insects usually pass the winter in this stage. In this stage, the circulation and respiration is much lessened, while the supply of fat stored up by the larvæ is sufficient for the needs of the pupa.

It is interesting to study the pupal forms of insects, with reference to their adaptations to their surroundings. When pupæ are incased within cocoons (Figs. 37, 38, 39) or earthen cells (Fig. 36) they are smooth and rounded, but when chrysalids are formed, such as is the case with butterflies, and when there is considerable exposure to wind and weather, they are rough and angular (Fig. 40 *b*). The chrysalids of the Nymphalidæ, to which the Milk-Weed Butterfly belongs (Fig. 41), are all suspended by means of a button of silk to the under surface of some object, and they swing freely. It is plain that the "horny tubercles and roughened, calloused ridges" of such chrysalids protect the swaying bodies. The chrysalids of the Papilionidæ (Fig. 42),

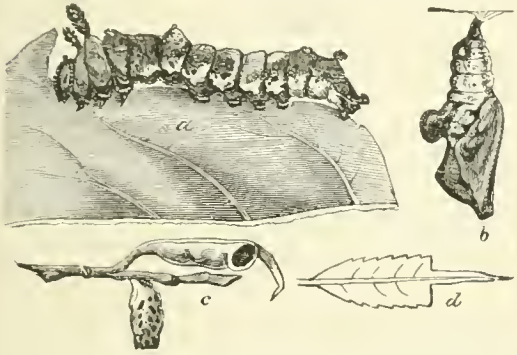


Fig. 40. *a*, Larva; *b*, chrysalis of Limenitis disippus butterfly, showing angulations and mode of suspension.

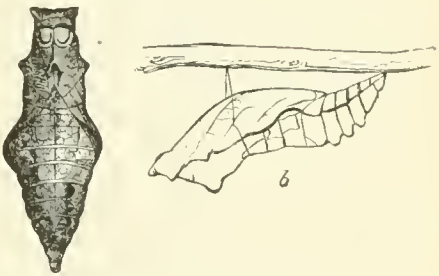


Fig. 43. Chrysalis of Papilio philenor. *a*, Back view, showing angulations; *b*, side view, showing mode of suspension.

to which our Swallow-tails and Cabbage-butterfly belong, are held in place both by a button of silk and by a girdle of the same material, which passes around the middle of the chrysalis.

Among the common insects which hibernate as pupæ are :

The Sphinges (*Sphingidæ*).

Cabbage-butterflies (*Pieris rapæ*).

Cecropia (*Samia cecropia*).

Polyphemus (*Telea polyphemus*).

Corn-Worm (*Heliothis armiger*).

Army-Worm (*Leucania unipuncta*)

Datana Ministra.

Spring Canker-Worm (*Palæacrita vernata*).

Pea and Bean Weevils (*Bruchus pisi, B. obtectus*)

Squash-Borers (*Melittia ceto*).

Potato Beetle (*Doryphora decemlineata*).

Saw-flies (*Tenthredinidæ*).

Phorbia.

Oberea bimaculata.

Pear Midge (*Diplosis pyrivora*).

Clover-seed Midge (*Cecidomyia leguminicola*).

The Adults. Many insects in their adult condition are strongly chitinized and otherwise protected against wind, cold and rain. Such forms are well able to hibernate, more especially in the dormant condition. Among common forms are :

Grape-vine Flea-beetle (*Haltica chalybea*)

Plum Curculio (*Conotrachelus nenuphar*)

Potato-stalk Borer (*Trichobaris 3—notata*)

Asparagus Beetles (*Crioceris asparagi and C. 12—punctata*), Figs. 16, 19.
Potato Beetles
Cucumber Beetles (*Diabrotica vittata, D. 12—punctata*), Figs. 44, 45.
Buffalo Carpet Beetles (*Anthrenus scrophulariae*)
Bark Beetles (*Scolytidae*)
Squash-bugs (*Anasa tristis*)
Lace-Bugs (*Tingitidae*)
Chinch-bugs (*Lygaeidae*)
Stink-bugs (*Pentatomidae*)
Pear-tree Psylla (*Psylla pyricola*)
Leaf-Hoppers (*Jassidae*)
Green-fruit Worm (*Xylina*)
Mourning Cloak Butterfly (*Vanessa antiopa*)
Army Worm (*Leucania unipuncta*)

Fig. 44. Diabrotica Vittata.

Fig. 45, Diabrotica 12—Punctata.

The more the question of hibernation forms is studied, the more difficult it seems to account for the great number of variations; at the same time it becomes apparent that the particular form assumed during winter can only be determined by a study of the phylogeny of the insect. All Zoologists are not agreed as to the probable habitat of the primitive insects, but the bulk of the evidence points to them as land-dwellers and not water-dwellers. That the primitive adult insects were wingless and like the larvae is also conceded. They were ametabolic, that is, undergoing no metamorphosis. Our Thysanurans are supposed by some Zoologists to reveal many of the characters of the primitive insects. They live in damp places, under stones and rubbish, and are protected by these objects during winter, and there is no need for any special hibernation form. We can readily imagine, however, that as the numbers of the primitive insects increased, a "struggle for existence" would arise, and natural selection would choose out those forms that by accident, or otherwise, adapted themselves to changed conditions, either on land, in the air, or in the water. Tracheal gills of aquatic larvae may be regarded as an adaptation to an aquatic condition, and wings as an adaptation to an aerial existence. When insects possessed wings, environmental changes would be great and there would arise the necessity for a "Division of Labor" on account of the difficulty in securing food during the winter season. The larval stage was devoted to the acquiring of food, and to growth, and the adult to reproduction. Then came the pupal stage, as an act of necessity, to bridge over the gap between larva and adult, when preparations could be made for the complete formation of the adult. According to this, the pupa would be the normal hibernation form for most insects in our latitude.

ANOSIA ARCHIPPUS DOES NOT HIBERNATE.

By J. Alston Moffat, London, Ont.

The method of explaining the unobserved portions of the life history of *Anosia Archippus* by analogy, or bringing them into conformity with what was known in the life history of other butterflies, has retarded rather than assisted in removing the difficulties connected with it. There are several peculiarities in the life history of that butterfly which have been often enough observed to place them amongst the established laws of its nature, that are so different from anything known in the life of other butterflies, that it becomes necessary to seek an explanation of the unobserved portions of its history, in accordance with what is known in its own life rather than in the life history of other butterflies.

For instance, it does not pass the winter in the mature state in this locality. Nor can it survive it in any of the stages of its existence in its northern breeding grounds; hence after

each succeeding winter these regions where it is produced in the greatest abundance have to be replenished in the spring by individuals coming from the south. (Using these geographical terms in an undefined manner). Its noticeable habit of congregating in immense swarms in the north at the end of summer, combined with their utter disregard for each other sexually, whilst closely associated with each other individually for so long a time, is without a parallel in any other known species and therefore has a special significance of its own. Then the fact that these swarms move off together on the approach of winter, as if by mutual understanding, in a southerly direction, combined with the fact that similar swarms have been observed on more than one occasion wintering in the south, where such multitudes could not have been bred on account of the scarcity of their food plant there, clearly indicates that they had come from the north where they are bred in such profusion. When I wrote my paper for the 31st annual Report of the Entomological Society of Ontario, 1900, although quite convinced that *Anosia Archippus* was not a hibernating butterfly, yet I could not produce the evidence necessary to sustain and justify my belief, so I sent a copy of that report to Dr. Thaxter with a note calling his attention to it, that he might have an opportunity of correcting any erroneous conclusions I had arrived at, if he thought necessary. In return I received a most genial acknowledgement from the doctor, from which I have the pleasure of copying the following statement which is connected with the subject in hand :

" About those Archippus butterflies I have a memorandum on the sketch which I made at Appalachicola [which was published in the *Canadian Entomologist*, vol. xii. (1880) page 38], Fig. 46 to the effect that it was drawn from nature January 3rd, 1873. If I remember rightly the butterflies did not begin to scatter till February and then many were seen in coitu."

That appears to be conclusive and makes it certain that those flocks of *Archippus* butterflies seen by Dr. Thaxter in Florida (Fig. 46), were not there in search of a place to hibernate, but with the intention of passing the time in an active state until their season for breeding had arrived. The chain of evidence now seems to be complete, although every link in that chain has not yet been forged ; that those immense swarms that come together in the north where they were produced in such profusion, take their departure in flocks from the north for the very purpose of going south to winter there. Not always in a direct line but always tending in that direction, their movements are influenced by the nature of the route and the character of the weather. Not rushing impetuously onward to their destination as some butterflies are reported as doing, "Entomologist's Record," vol. xiii., page 98, but as becoming their regal character, deliberate and dignified in all their movements ; enjoying their journey and the novelties of the way ; having none of the distractions of family affairs to disturb their equanimity, being quite conscious that the serious business of their life is well off in the future and that in good time they will reach a suitable locality where they may spend the winter in comfort and safety.

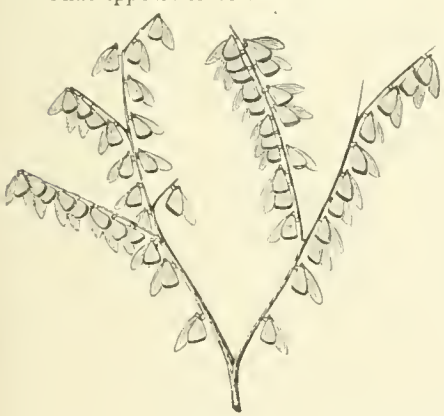


Fig. 46.

Having thus obtained a satisfactory explanation of their autumnal gatherings in the north, as part of their constitutional habit of wintering in the south, one may regard that portion of *Archippus* life history as conclusively settled, and turn our attention to its spring movements, and enquire, when and from whence do the northerly migrations originate? In the absence of observed data we will have to be guided in the formation of our opinions on the subject, by the well known habits of the butterfly, and the climatic conditions of the localities it frequents.

Those swarms of *Archippus* that were seen wintering in Florida, probably reached that locality from somewhere in the north, about the end of November. They broke up in February and dispersed. Then, as is naturally to be expected, the sexual desires which had for so long lain dormant were aroused, and they prepared to carry out the purpose of their existence, namely, the multiplication of their kind. With that end in view they must first find *Asclepias* the food-plant of their progeny; reported to be always scarce in Florida, and in February probably no fresh plants of it to be seen there. Where then are they to obtain it? Certainly not by going northward at that time of the year, but by going still further south.

Prof. Riley as early as 1878 made observations upon southerly spring movements, but being confused with the hibernating theory he failed to realize their full significance. From an article in the "Scientific American" for April 6, 1878, a part of which he produced in the "American Entomologist," Volume III., Page 102, I copy the following that bears on the subject. After giving his view of their manner of spreading northward in the summer, and their flocking to the south in autumn, he says:

"We can thus understand how there are two, three or more broods in southerly regions, but only one toward British America. The exceptional flights noticed in the spring, and which, so far as recorded, take place quite early and in the same southerly direction, find a similar explanation. They may be looked upon as continuations of the autumn flights. Hibernating in the temperate belt, the butterflies are awakened and aroused upon the advent of spring, to find the milk-weeds not yet started, and they instinctively pass to more southern regions, where spring is more advanced."

Eliminating from that statement the hibernating idea, it is otherwise quite in accordance with what we know of the habits of the butterfly. Whilst the region of which Dr. Riley was speaking being Texas, Indian Territory and Kansas, where the autumn flocks would be gathered from a different part of the continent than those came from which were seen in Florida, their movements would be influenced by the character of that region, yet their natural disposition would remain the same, which is to move on and extend the species where ever it can find suitable conditions. Now the whole literature of the species testifies to its being a wanderer. Yet we know by its conduct in the north that it does not wander aimlesly. It seems to have a purpose and "a method in its madness" in that respect which looks wonderfully intelligent.

That habit being constitutional to the species, it will be found in some measure to influence every individual of it and control its movements to the utmost limits of its southern habitat on this continent, therefore, we are not warranted in restricting its northerly migratory movements in the spring to those individuals found in the more northern portions of its southern home. For those northern bred specimens that wintered there, when they have been aroused to activity by the approach of their breeding season, will move southward for we know not how far, depositing eggs as they go before they are exhausted, whilst at the same time, those born in extreme limits of its southern breeding grounds, impelled by that intense desire to travel and spread its kind will be moving northward. Thus migrations in opposite directions will be going on together; and it may yet be discovered, that the majestic sweep of that annual movement is far more extensive, regular and continuous than has ever been suspected.

On such considerations as these, in the absence of actual observations, we have to depend in forming our conclusions as to when, and from whence, the first arrivals in the north have their origin. Those that reach West Virginia about the end of March, would appear necessarily to come from somewhere much further south than Florida; whilst those that reach Ontario about the end of May, might be born there or thereabout. But so much depends upon the character of the seasons, and the directness or otherwise of the flight of the butterflies, that all positive conclusions must be withheld. The climate of Florida is not always favorable as a winter residence for the butterfly. Cold waves from the north descend upon it at times,

so as to destroy the orange groves, and a few years ago a frost in the South nearly exterminated the blue birds, and for years after scarcely one was to be seen in Ontario, and only now are they becoming common, and it may be years yet before they are as plentiful as formerly.

Now, *Archippus* is not likely to survive a frost that killed blue birds; yet no one in the north observed an unusual absence of Archippus in the following season, as was the case with the blue birds; and yet the probability is, that a wide belt along the South Atlantic States was swept clear of this particular butterfly during that winter. So we see that such a widely extended migratory movement is necessary to maintain the regular northern supply for propagating purposes in that region.

In regard to the number of broods in a season produced by the species in its tropical home, we are as yet without information. But, from what we know of its nature and habits, it seems as if it would require several to enable it to complete its annual functions. That it has no well defined broods in the north is certain, and the long continued straggling nature of its oviposition supplies us with the reason for it. (Scudder's "Butterflies of Eastern U. S. and Canada," Vol. I. page 742). And as it will follow the same course in the South, it will make it very difficult to determine the number of its broods there. That Mr. Edwards has seen them pairing in W. Va. is indicated by his remarks when dealing with the subject ("Psyche," Vol. II., page 169), which may be regarded as illustrating its habits in that locality, but that there would be as many broods in nature as he obtained in confinement does not seem probable; or that the butterflies bred there in nature would remain there to breed again is not at all likely, as it is not in accordance with its nature and habits to do so. I saw *Archippus* pairing on one occasion at Hamilton, in numbers, about the middle of June (Can. Ent., Vol. XX., p. 137). But singularly enough, it was the only instance of the kind that I ever witnessed; and that single instance cannot be regarded as exhibiting the regular habit of the species in that locality, but rather as an unusual and exceptional occurrence, for which there would be some special reason if we only could trace it. I do not now consider that those pairing individuals that I saw would be the first arrivals of the season for that year, but rather that they belonged to a brood produced in some less distant locality, but yet had travelled far before they were ready to mate, and would proceed yet further north in conformity with the established habits of the species.

The desire to travel, which is so strongly developed in *Anosia Archippus*, and which is so strikingly disclosed in its regular migrations on this continent, which constrains it as it were to turn its head northward in the spring, and southward in the autumn, and holds it as rigidly to these points of the compass until it reaches the furthest limits of favorable breeding conditions, is a faculty of direction which we do not yet comprehend. The migrations of birds will not assist us to unravel the mystery, as the old birds are supposed to guide the young ones on their first trip. The finding of their homes at long distances by cats, dogs and carrier pigeons does not apply, as in these instances it is with them a return journey; none of our butterflies were ever over that road before. Sight avails them not. Scent, as we know it, cannot assist them; and yet there may be an influence in the air affecting them that suggests both the time to start and the direction in which to go. We know that in some of the lower animals a particular sense can be found that is far more highly developed than the same one is in man. And we also know as a fact, although we cannot explain its operation, that there is in some of the lowest forms of life, where there is no nervous organization to receive an impression, a phenomenon termed "Heliotropism," signifying a turning towards the sun, which is as constant and certain in its operation as any other law of nature. Now, may there not be in these butterflies a sense perception of direction, of which we know nothing, but of whose presence they are perfectly conscious, and to whose promptings from without, they respond as readily as to their food, and which guides them as unerringly as in the choice of a food plant for their progeny? An influence in the atmosphere or from the sun, a kind of Heliotropism; or one that

seems to combine all others, and one which is getting to be more and more acknowledged as pervading and influencing everything, whilst uniting objects the most distant, and, as it were, obliterating space, but which has not yet, in this direction, found a place in the domain of science, namely,—electricity and magnetism? An influence which so acts upon their sensibilities as to prompt them to move in unison, at the proper time and in the right direction,—confidently, but unconcernedly as to cause or consequences!

COLLECTING AT LIGHT IN 1901.

By J. D. Evans, Trenton.

Early in June last the writer commenced collecting at an incandescent electric light which was continued every night with very few exceptions until about the middle of September; the light was outside and in front of the front porch; immediately below the light was fixed a funnel made of heavy white paper, and below and contiguous thereto was placed a deep glass jar containing cyanide of potassium. This would be placed in position at dusk and left out (except when rain threatened) all night.

On a favourable night myriads of insect life would be taken, caddis flies predominating, but always accompanied by a goodly percentage of moths, beetles flies, and bugs, with a few Hymenoptera. Upon the most unpromising nights 25 or 30 moths would be taken, which would increase to 100 or 150, or more, on a favourable night. The subdued light shed by the white paper seemed to have a peculiar attraction for the insects, for very few entered the house although windows were open and rooms well lighted.

Of the moths some species were taken in large numbers, particularly micros. Among the varieties may be mentioned *Plusia contexta*, and *P. striatella*: also *Xanthia togata* and a number of species not yet determined.

Among the Coleoptera many families were represented, and many species rarely met with were taken in large numbers, a list of which will be prepared at an early date. Among the families most numerously represented may be mentioned Carabidæ, about 40 or 50 species, Hydrophilidæ, Nitidulidæ, Elateridæ, Scarabæidæ, Cerambycidæ, Chrysomelidæ, and Anthicidæ.

The Hemiptera were represented chiefly by fully 20 species of leaf-hoppers.

Very few insects were taken during the season other than by light.

I can record the capture of a fine specimen of *Papilio cresphontes* in the garden on the 20th August; it was hovering over a patch of Phlox Drummondii.

THE MILKWEED AT DUSK.

By Albert F. Winn, Montreal.

The attractiveness to insects of the flowers of the milkweed (*Asclepias cornuti*) has given rise to a new popular name of "Butterfly Weed" being applied to it. This name certainly appears appropriate enough to any one passing a patch of the plant in full bloom on a hot July day, with the blooms and the air around just alive with gay butterflies. But the entomologist wants something better than *Danais archippus*, the various species of *Argynnis*, *Limenitis disippus*, and *Pamphilus*, when he has a day to spend in the fields, and if he spends much time around the milkweed he will probably come home with a great quantity of specimens of a dozen species of the commonest of our butterflies, which he will carefully put away in papers to remain there till doomsday.

I have often wished to have the opportunity of watching the milkweed blossoms regularly in the evenings, but till this summer have not had the chance. In July of this year I spent my

fortnight's vacation at Fortune's Rocks, near Biddeford, Maine, and the day after my arrival I came across a fine patch of milkweed in the centre of a hayfield, the plants flourishing there owing to the ground in this spot being higher than the rest and rocky, so the mowing machines failed to do their deadly work. The usual array of butterflies were eager to quench their thirst, and an occasional bee moth, *Hemaris thysbe*, darted about from flower to flower. Being close to the house where I was staying I felt that now was the chance to see whether the plants were not something else than "butterfly weeds," and on the evening of July 8th I sallied forth at about 7.15, armed with a net and two cyanide bottles. The first insect I saw was a big dragon fly busily engaged among the mosquitoes, which were exceedingly voracious. Nothing was on the blossoms but a few belated ichneumons and bees when I first arrived, but about 7.20 the *Heliophila pallens* and *adonea* appeared in perfect swarms, crawling all over the blooms. At 7.30 it began to be more like twilight and something dashed through the field and hovered near me over the plants. My first shot missed it, but it soon returned to another flower head and was captured—a *Sphinx gordius* (fig. 48). A moment later I had another of the same kind. Then a smaller dark fellow appeared, evidently a hawk moth, but new to me—*Dolba hylaeus* (fig. 47.) With this and the first *gordius* in one bottle, and the second *gordius* alive in the other, I was beginning to wonder what I should do if another Sphinx came along. It soon came in the shape of *S. kalmiae* (fig. 49), so I put the three previous captures in one bottle and he *kalmiae* in the other, when another *kalmiae* hovered right in front of me, but before I struck at it I noticed a few steps further on another *Dolba hylaeus*, and thinking this too great a prize to miss on account of a *kalmiae*, I made a stroke through the plant and to my surprise found I had not only the *Dolba* but two *S. gordius* as well. Didn't the scales fly from their wings? By this time the patch was simply alive with Sphingidae, and having filled both bottles I returned to the house, but found most of the specimens had suffered through being put into too small a space while alive. I should have known better, but one who has been accustomed to catching perhaps a dozen Sphingidae in a season is not likely to abstain from catching as many as possible when occasion arises, therefore any one knowing of an isolated patch of milkweed in full bloom during the flying season of the Sphingidae should go prepared.

The following evening seemed even more favorable, and I took my whole stock of bottles, four in number, a tin box charged with cyanide, and a box with cotton wool in it,—and Mrs. Winn accompanied me with another net. As on the previous night it was about 7 30 before any Sphingidae showed up, about half a dozen *Dolba hylaeus* arriving simultaneously, then *Sphinx gordius*, these two being always first—perhaps because there were more of them. A *S. Kalmiae* then flew over the patch without settling down, and with a sudden raising of the wings of one side darted across the field again, only to return in a few seconds. The eye could easily follow this species in the partial light owing to the light brown color, and they were noticeably shy till it became almost dark, perhaps instinct taught them that their colors were not a protection while hovering over flowers and dark leaves, though what enemies they have other than human beings I do not know. We used the bottles one after the other, and when No. 4 was occupied the Sphinx in No. 1 was transferred to the cyanide box in case there might be any life left in him; then No. 2 into the box, and so on. Even then we could not kill them half quickly enough—and every minute some new kinds seemed to be appearing. *Philampelus achemon*, *Sphinx drupiferarum*, *Deilephila lineata*, *Darapsa choerilus* and *myron* were plentiful, and a single *Sphinx luscitiosa*. There were so many specimens on the same head of flowers that it was difficult to pick out a particular one from among the humming throng. We soon found that making a stroke upwards was the only way to catch one at a time, a stroke through the blooms or downward over it meant at least a dozen—and pandemonium.

We soon got acquainted with the habits and appearance of the different species—the little *Dolba hylaeus* being easily noticed by its small size and dark color and keeping mostly to the

edges of the patch—*gordius* looking nearly black and twice the size of *hylaeus—drupiferarum* in turn seemed blacker still, the pale costa making it conspicuous—*S. kalmiae* was quite unmistakeable in its flight from flower to flower on account of its color—*Darapsa myron* and *choerilus* were easily picked out by their small size and different flight, and they even settled on the blossoms—the large bodied *Philampelus achemon* and *pandorus* were also as easily recognized in the semi-darkness as in a glass covered cabinet drawer.

Our second evening resulted in our bringing home over forty specimens, belonging to ten species of hawk moths.

I shall not take up more time with details of further evenings spent at the same spot, but every visit was time well spent. Many interesting specimens among the smaller moths were captured. *Plusias, Hadenas, Heliophilas and Mamestra* being in myriads some nights. On the last evening of my stay, July 20th, I caught only seven Sphingidae, but do not think their season

Fig. 47.—Dolba hylæs.

Fig. 48.—Sphinx gordius

Fig. 49.—Sphinx kalmiæ.

was over for I took these within a few minutes of my arrival, and a cold thick fog came up over the fields just before I left them and it is not unlikely that the insects felt it before I did.

For anyone fond of nature, it would not be easy to select a spot more interesting to spend an hour in, than that occupied by my milkweed patch—on its slight elevation, in the midst of hayfields, the sunset gradually fading away over the Maine Woods and the day-flying fauna disappearing to their resting places, to be replaced by a nocturnal fauna as invisible by day as the former is at night. The scent from the milkweed plant grows stronger as darkness sets in, the moths begin to flutter about, the whip-poor-will is heard on every side and the roar of the sea on the shore seems more soothing than by day.

We cannot all have the accompaniment of the ocean, but any entomologist who has not examined the milkweed blooms at dusk has a pleasure still to look forward to.

A COLLECTING TRIP IN SOUTH-WESTERN ONTARIO.

By E. M. Walker, Toronto.

During August, 1901, the writer had the good fortune to accompany Prof. John Macoun, Naturalist to the Geological Survey of Canada, on a collecting trip in the South-Western peninsula of Ontario.

Prof. Macoun's investigations occupied the whole summer, from the latter part of May until the beginning of September, and collections of plants were made at a great many localities, covering practically the whole district.

The chief object which I had in view in making the trip was the collection of Orthoptera, as the region traversed was quite unexplored from this point of view. The time which I had at my disposal, however, was limited to the month of August, so that I was unable to visit localities enough to represent the entire district.

While most of my attention was given to the Orthoptera, I also collected a considerable number of Odonata and kept on the lookout for anything of special interest in the entomological or botanical line.

Our first stop was made at Leamington, a place not specially interesting in itself, but one from which several very profitable trips can be made. The chief of these is the trip to Point Pelee, the extreme end of which is some twelve miles distant from the town. It is a long sandy point, very narrow in its lower part, where it is largely covered with red cedar and juniper, but is somewhat wider in its upper part with sand dunes of some size on the west side, beyond which on the east are broad prairie-like flats of excellent wheat lands, formerly marshy. There are still marshes which will repay the collector in probably any branch of Insecta. The upper part of the point is beautifully wooded with magnificent walnuts, nettle-trees (*Celtis occidentalis*), basswood, cottonwood, etc., and a variety of oaks, with junipers in the more open places and near the beach : and many southern plants and insects are found there. I spent a day on the Point, and saw a *Papilio Ajax*, several of *P. Cresphontes*, any number of *P. Troilus* and captured a beautiful specimen of *Limenitis Ursula*.

Along the roads leading from Leamington to the Point *Papilio troilus* and *asterias*, especially the former were present in astonishing numbers. The presence of the former is what one would expect from the large number of Sassafras trees in the locality.

The bordered skipper (*Ancyloxypha numitor*) was present in great numbers along every roadside ditch and many specimens of another southern skipper (*Pholisora Catullus*) were also seen. The tobacco-worm, *Phlegethontius Carolina* is common in this district on the leaves of the tobacco which is grown in large quantities and of good quality in this part of the province.

The Orthoptera were very interesting, the family *Locustidae* or green grasshoppers and katydids being abundantly represented in the large open marshes at the north end of the Point. In fact I found them to be very well represented everywhere throughout Southern Ontario, the group being on the whole a decidedly austral one. This fact will be appreciated when the number of species inhabiting Southern Ontario is compared with those of the Nipissing and Muskoka districts. I took about 21 species in southern Ontario, whereas in Muskoka there are but eight and in Nipissing probably not more than five, only one of which is truly characteristic of the north. Most of the 21 southern species are Ohio and Indiana forms, such as *Xiphidium Scudderi* and *nigropleurum*, *Orchelimum indianense*, *O. longipenne*, *Conocephalus nebrascensis*, etc.

One marsh, especially at Point Pelee, yielded a remarkable variety of forms within a comparatively small area. This was at the mouth of a small creek which emptied into the lake at the upper end of the Point. On either side of the creek was a growth of wild rice, so tall and vigorous that at a short distance it had much the appearance of a field of Indian corn, and beyond

this, where the ground was not quite so wet, was an extensive growth of rushes and sedge. It was in the sedge that the green grasshoppers were most abundant, but they were very difficult to capture since, when alarmed, most species of Locustidae, especially the smaller kinds, have the annoying habit of darting downwards into the sedge and then leaping rapidly from one stem to another until one has not the least idea where to look for them. Fortunately, however, most species are found in large numbers when their particular haunts are discovered.

In this marsh, and practically in one spot, I took no less than a dozen kinds of Locustidae alone, all but two of which are unrecorded from Canada. Of these, one of the most striking in appearance though the smallest in size, is *Xiphidium Scudderi*, a long-legged little hopper, brownish instead of the usual green color, with short wings, long antennae and an extraordinarily long straight oripositor, often twice as long as the body. *X. attenuatum*, of which I found a few specimens, seems to be merely a long-winged form of the same species. Another interesting addition to our fauna made at Point Pelee is *Scudderia Texensis*, a very large bright green form related to the well-known *S. curvicauda* but larger. It is one of the katydid tribe and has a wing expanse of fully three and three-quarters inches.

The most abundantly represented genus, however, was *Orchelimum*, six species being found. Now this is remarkable when it is remembered that from Toronto northward to Lake Superior only one species occurs and that a very common and widespread one, viz., *O. agile*. This, by the way, is the common meadow grasshopper, whose familiar song, the "jip, jip, jip, zee-e-e," is known to everyone.

The other families of Orthoptera did not yield so many new forms, but one of them taken in the same marsh as the one just described was wholly unexpected and has a very southern distribution. This is *Tryxalis brevicornis*, a slender green and brown Acridian, with a long conical head and short flattened antennae. Its distribution as hitherto known is from Indiana and Long Id. to Honduras and Brazil, its occurrence in Indiana having been considered as unusually far north. I got but two specimens, both males, in good condition.

Another trip which we took from Leamington was to Arner, a village a few miles west of Kingsville. There were large open marshes here also, but although apparently very similar to those of Point Pelee, both the flora and insect fauna were in many respects different, some species common at Arner being entirely absent from the Point and vice versa. For example, not a single specimen of *Paroxya floridana* was seen at Point Pelee though very common at Arner, and *Orchelimum Bruneri* was very common at Point Pelee, but none were seen at Arner. This was in fact the only locality visited during the present trip where the first named species was found. It is a pretty brightly colored grasshopper with blue hind tibiae and is characteristic of the Eastern States from southern New England and Indiana to Florida, not having been taken in Canada before.

Another very interesting form taken at Arner which must not be overlooked is *Atlanticus pachymerus*, belonging to the Decticinae, a group of Locustidae, characteristic of the western half of North America, Atlanticus being the only eastern genus. It is a large, clumsy, brown, cricket-like form, the female quite devoid of either tegmina or wings, though the male has retained the tegmina as organs of stridulation. The thorax is very large and shield-like, and this feature has given the insect the name of the shield-back grasshopper. It is found in ravines and wooded hill-sides, but I came across it only at Arner.

From Leamington we went to Sarnia but on the way we stopped for five hours at Chatham and went for a tramp along the Thames embankment. Here the flora was quite unique in character and of great luxuriance and vigor, the nettles and Jerusalem artichokes towering far above our heads. The Professor pointed out several prairie species there, not found elsewhere in the Province, and it is his belief that this section was once prairie. It certainly would appear so to

judge by the presence of these typically prairie plants and the general perfectly level appearance of the country.

At Sarnia there is a great deal to interest the entomologist and Prof. Macoun found a great number of plants not recorded from Canada, among which was a grass new to science. The most striking thing in the insect line was the abundance of *Papilio Cresphontes*. Any number could have been taken but I had no space in either my bottles or boxes for anything but Orthoptera and dragon-flies. Another interesting butterfly found here and both at Chatham and Leamington was *Pieris protodice*. At the two latter places it is the common white butterfly, *rapae* being only occasionally seen At Sarnia both are common but *protodice* is much the more predominant, while further north only *rapae* is seen.

This re-appearance of *P. protodice* after its apparent replacement by *P. rapae* strikes one as being quite remarkable, and it seems to confirm Mr. Moffat's opinion, expressed in the Twenty-fifth Annual Report of the Entomological Society, p. 61. He refers to the rapidity with which this change was brought about and regards as very improbable the theory that the disappearance of *P. protodice* has resulted as a consequence of the struggle for existence and the survival of the fittest. Mr. Moffat's idea is, briefly, that the two forms are races of one species, which on being brought together have interbred ; the result being the persistence of the characteristics of the stronger race, *rapae*, and the suppression of those of the weaker, *protodice*. But although *protodice* is weaker, its characters are such as have resulted from its particular environment, such as the climatic conditions and other external influences under which it lives ; and hence these characters must inevitably reappear in time as these same forces are still at work. Mr. Moffat also noted the recent capture of a few specimens of *protodice* in the vicinity of London and expressed the opinion that it would be common again in time. That it is becoming so seems to be evident from what I have observed in Southern Ontario, whatever the explanation may be.

Of Orthoptera and Odonata a number of interesting things were taken. Most of these were captured in a large open stretch of meadow-land, which extends along the St. Clair River between the town and the southernmost point of Lake Huron, where the St. Clair River leaves it. This stretch of country is under water during the spring and early summer but was quite dry when I saw it in August, and portions of it were gorgeous with the purple spikes of *Liatris spicata*, the dense button-snakeroot, making one of the most brilliant floral displays I have ever seen. Several interesting things were found here, notably *Orphulella pelidna* and *Conocephalus nebrascensis* neither of which had been taken before in Canada, nor were they met with again during our trip. I also took specimens of the two beautiful dragonflies, *Celithemis eponina* and *C. elisa*, the former flying about for the most part near the river where the ground was still wet, the latter being commoner further inland.

Separating this stretch of meadow-land from the wide beach of the lake is a high ridge of sand dunes wooded mainly with oak, while west of the town of Sarnia is the cemetery, which is also sandy, being much like High Park in character. Both of these localities, especially the latter, will richly repay the efforts of the entomologist.

Before leaving Sarnia finally the Professor and I crossed the river to Port Huron and thence took the electric railway down the river to Algonac, where we hired an Indian boy to ferry us across to Walpole Id. This is a Canadian island of considerable size and has been set apart as an Indian Reserve. It is an excellent collecting-ground being for the most part occupied by woods or marshes. Here I saw a great many *Papilio Cresphontes*, *Limenitis disippus*, *Pieris protodice* and other butterflies sipping the moisture from the ground near the water's edge. The marshes yielded numbers of *Orchelimum longipenne*, a green grasshopper only one specimen of which was seen elsewhere, namely at Point Pelee. I was indeed much struck throughout the trip by the fact that these open marshes, though often apparently of the same character and not far distant from one another, may support faunas which are by no means identical, some species

found not at all or very sparingly in one marsh being common in another and vice versa. I was unable to discover the reason of this but I imagine that on closer examination the conditions would prove to be more different than was apparent at first sight, or that many of the insects found therein are very local.

From Sarnia we went by steamboat to Goderich, which town we did not find very interesting from a natural history standpoint, the country being entirely of a clayey character; so we contented ourselves with a single day's trip which was very unprofitable entomologically, the only thing of special interest which was taken being a specimen of *Cychrus Lecontei*, a rather rare carabid beetle.

Our next stopping place was Southamptom, a locality which amply repaid both of us and one where a great variety of country is to be found close at hand. The shore, which at Goderich is a steep clay bank about 200 feet high, is again low and sandy, a magnificent beach which strongly recalled the sea shore extending for some miles on either side of the town.

The forest growth here is quite boreal in character; white spruce, white cedar and juniper (*Juniperus communis* and *J. sabina* var *procumbens*) being the prevailing trees on the sand dunes which form a ridge behind the beach. Back of this ridge a short distance south of the town is an extensive swamp, in which the orthopterous fauna was also of northern type.

The most interesting capture made here however was an Oedipodine, a new species of *Trimerotropis*, which was found flying about on the beach, having essentially the same habits as *T. maritima*, which is abundant on the beaches of the great lakes further south, extending a little above Sarnia and is also found on the North Atlantic seaboard. As soon as I observed this extensive beach at Southampton I thought of the probability that either *T. maritima* would be found there, and if so at a much more northern locality than hitherto reported, or that some other species would take its place. After considerable search the latter proved to be the case and the species which replaced *maritima*, though closely allied, differs from that species not only in structure and markings but also markedly in the character of the stridulation.

I did not find much else of particular interest at Southampton, but this was doubtless because I paid small attention to anything but Orthoptera and Odonata; but on general principles I should highly recommend the locality to entomologists who are studying the Ontario species of any group of insects, because I believe there are very few, if any, places of exactly the same character in the Province. I doubt if a wide and extensive beach is to be found anywhere north of Southampton, as the eastern shore of Lake Huron north of a point about ten miles above Southampton is, as far as I know, continuously rocky.

After spending a few days collecting at Southampton we hired a good sized fishing boat and spent a most delightful week on the lake between Southampton and a small town called Tobermory, a few miles from Cape Hurd on the Georgian Bay side. Our party included the Professor's assistant and two fishermen, besides ourselves, and the object we had in view was the examination of the east shore of the lake as far as the Cape and also a few of the islands.

We cooked our meals and slept on board, though at night we of course always put into some harbour, of which many fine examples are to be seen. At Tobermory, for instance, there is a beautiful harbour, about half a mile long, the shore of which at the town is perfectly vertical to a depth of about thirty feet below the surface and some three or four above, so that no wharf of any kind is necessary and large vessels can come up close to the shore.

A decidedly northern flora and fauna is to be met with in this peninsula, but Prof. Macoun says that half a mile or so inland these conditions give place to the ordinary hardwood forests, such as would be met with in any part of Ontario at that latitude. This northern climate is mainly due to its proximity to the cold lake, but another factor also contributes in some parts of the shore rendering the climatic conditions boreal in character. This occurs at certain points where the limestone is very low and flat and only just a little above the level of the lake. The

snow and ice in these places remain in the woods sometimes as late as June and in early summer the place is still very wet. Later on, however, it dries up and the rock is exposed or is very near the surface almost everywhere.

The soil on this peninsula is very scanty and on the low places near the shore the plants and insects are very few in number of species. The Professor said that the flora resembled that of Anticosti, but I did not notice much that was remarkable about the insects. A peculiar little Catocala was perhaps the most interesting thing taken. It is closely allied to *C. antinympha*, if, indeed, it be not a variety of that species, from which it differs in the much lighter and more distinctly marked fore wings.

Among the Orthoptera *Podisma variegata*, two long-winged males of *Melanoplus fasciatus*, a form of very rare occurrence, *M. islandicus* and *Scudderia pistillata* are perhaps noteworthy. The first named is a very interesting Acridian of the group Melanopli and belongs to an alpine and northern genus, being the only American species which is not alpine. Like many alpine insects it is perfectly apterous and is closely allied to *P. glacialis* of the White Mountains and Northern Ontario. I have also taken it at Lake Simcoe. It inhabits cool swamps, especially peat bogs. *Scudderia pistillata*, which was found not uncommonly on the peninsula and at Southampton, is our one characteristically northern Locustid. It was exceedingly abundant on one of the small islands.

Before leaving the subject of this locality there is one fact concerning it which is worthy of remark, and this, though a botanical one, would probably influence the insects too. Many flowers common to this region and southern Ontario (notably Point Pelee and Sarnia) were in bloom or going to seed at a time when the same plants in the south were in bud or only just beginning to bloom. Now, this state of affairs at first seems very extraordinary when we remember that the snow remains so late here and the climate is decidedly colder than in the south. The explanation lies in the fact that the plants are growing over limestone, which absorbs more heat than any other rock, and much more than the ordinary soil.

After our return to Southampton we spent a few more days there and then drove to Owen Sound, where the limestone forms a bold escarpment overlooking the city and offers new conditions to the collector of both plants and insects. Deep crevices extend far into the rock and from above one can look down these, often forty feet. Some rare ferns are found here, but I got but little that was of interest to the entomologist, though I fancy a coleopterist could have taken plenty of interesting things.

Another locality at Owen Sound which the collector should not overlook is the Patterson House Park, the property of Mr. Matthews, the proprietor of the Patterson House, which is one of the chief hotels at Owen Sound. The park is several miles long and follows a ravine, along the bottom of which a small creek runs. The woods are in a primitive condition and some of the trees, notably the cedars, are of enormous size. The chief thing of interest that I found there were specimens of *Calopteryx maculata*, a beautiful dragon-fly which, though very common in June, usually disappears late in July, my specimens having been taken on the last day of August, an unusually late date. The luxuriance and beauty of this ravine would, I am sure, make it an admirable collecting ground.

Owen Sound was the last spot visited by the writer before returning to Toronto, so that the trip was practically taken up in following the shores of Lake Erie and Huron from Point Pelee to Owen Sound

In conclusion I should like to emphasize one point in connection with the collection of specimens on a trip such as the one which has been the subject of this sketch. Most collectors, as far as I have observed, look for those species only which are wanting in their collections or which are rare or otherwise interesting. This is a great mistake. Every species in the group which the collector is studying should be noted down in a book kept for that purpose, and if

the collector is not absolutely certain of the identity of the species, specimens should be taken. It is better, if possible, to take specimens of every species from each locality visited, though, of course, this is unnecessary in the case of some very common and easily recognized species. It is only in this way that an accurate idea can be obtained of the distribution of the species in a given locality, and the value of an accurate knowledge of zoological distribution can scarcely be overestimated.

CRICKETS.

By Rev. Thomas W. Fyles, Levis, Quebec.

There are certain things which greatly excite the wonder of the Old Country visitor to Canada :—the piping of the tree-frogs in the Spring ; the flash of the fire flies in the Summer ; and the sibillations of Orthopterous insects in the Fall. Other sights and sounds may be new to him, but these intrude themselves so persistently upon his attention—there is so much of them in every case—that they never fail to make a deep impression upon his mind. When he walks out in a calm night of August or September, his ears are greeted with such a tweaking of banjos from the black-crickets, that he almost expects these *nigger* performers to start up a plantation song for his amusement. He thinks to himself, (we may suppose) that the solo of the "Cricket on the hearth" of English writers is a very poor performance, compared with this chorus of the Canadian crickets in the field.

The name cricket is one of those imitative, onomatopœic words, such as "wake-up," "pee-wit," "aye-aye," etc.

In my first year in the country-parts of Canada—long, long ago now—I was riding home at midnight from a visit to sick friend. My road was a lonely one, leading through the valleys of the Brome Mountains. I amused myself by putting together the following lines, suggested by the surroundings :—

On either side the road are rugged hills,
  And leafy branches mingle overhead ;
  O'er all, heaven's vast unclouded vault is spread,
Which the round moon with silver radiance fills,
The Gryllus chirrups ; the Œcanthus shrills—
  Ten-thousand quavering notes around are blent—
  The shaken air itself seems sibilant—
From every bush the constant burden trills.
It is to us as an outlandish tongue—
  We hear it, and pass on, acquiring nought ;
  We know not with what meanings it is fraught,
What triumphs, hopes and fears in it are sung.
To Him, who plann'd the Universe, alone
Ascends the import of each several tone.

But things that make so much noise in the world, as the crickets make, are deserving of more than passing attention ; and we may well spend a short time in looking into their structure, their habits and their history.

The crickets belong to the Orthoptera—Saltatoria or leaping straight-winged insects.

The first in order of the Quebec species is,—

Œcanthus niveus, DeGeer. (The Tree Cricket.)

This is an elegant creature well deserving of notice ; it is a little fairy robed in white—a dweller in the blossoms.

The male Œcanthus (Fig. 24, page 48) has transparent wing-covers rounded at the extremity and strongly veined. It is the combined friction and vibration of these veined wings that produces the notes with which it serenades its mistress.

The female (Fig. 25) has narrower wing-covers less strongly marked. Like a modest damsel she holds her peace.

These insects have ample and delicate hind wings, and long filiform antennæ. Their hindmost feet have four joints each—one more than we find in those of other crickets.

The female has a short, stout ovipositor with which it pierces the twigs of fruit trees, raspberry-canes, etc., and deposits her eggs in the wounds (Fig. 26). The young larvæ appear at midsummer, and feed upon aphides and small fruit.

Gryllotalpa borealis, Burmeister. (The Mole Cricket.)

The prince of our Canadian crickets is the Mole Cricket. It is a rare insect with us ; but it is common in some parts of the United States. In places where it abounds it has been found mischievous. It burrows in the gardens, and eats the roots of newly planted vegetables. 1,400 full grown mole crickets were once found on a surface of two fifths of an acre that had been planted with cabbages.*

Fig. 50. Mole Cricket.

Its disproportionately large front legs, its abbreviated wing covers, its pleated wings extending to points beyond these, and the long tags with which the body terminates give the mole cricket a strangely grotesque appearance.

The members first mentioned seemingly terminate in gauntleted hands with the fingers extended. But these seeming terminations are neither hands nor feet–they are the tibiæ or shanks of the front legs of the insect. The small feet are attached to the outside of them. With these shanks the cricket delves, and tunnels, and scoops out the chamber destined to be the receptacle of its eggs When not in use these tibiæ are drawn back and protected by the femora.

The length of the mole-cricket is about an inch and a quarter. Its colour is light bay or fawn.†

Much of our information upon the habits of the mole-cricket is derived from the Rev. Gilbert White who wrote more than a hundred and twenty years ago. In his delightful "Natural History of Selborne", he tells us that a gardener mowing beside a canal, struck his scythe too deep, and pared away a sod, exposing a mole cricket's nest and the approaches to it. "The nest was the size of a moderate snuff-box, Within the secret nursery were deposited near a hundred eggs of a dirty yellow colour and enveloped in a tough skin."

In Rennie's "Insect Architecture", enlarged by Rev. J. G. Wood (Bell and Dalby, London, 1869.), p. 266, a cut of the mole-cricket's nest and eggs is given. From this illustration we should infer that the "tough skin" is not a sack enclosing the batch of eggs, but the skin of the eggs individually, for the eggs are represented as lying in an open pile on the floor of the chamber.

*Dr. Fletcher in 22nd Ann. Rep. Ent. Soc. of Ont., p. 89.

†Harris's Insects injurious to Vegetation, p. 149.

The English mole-cricket is *Gryllotalpa vulgaris* Latr. It is a larger insect than *G. borealis*.

Dr. Lintner in his "Sixth Report on the Insects of the State of New York," says of *G. borealis*;—"Our-mole cricket lives in the ground, usually in moist earth—often on the sides of ponds or small streams, where it burrows into the moist ground at a depth of from six to eight inches, by means of its front pair of legs which are admirably constructed for digging. Its eggs are laid in these galleries, in a tough sack, to the number of from two to three hundred, within the chamber scooped out for the purpose." Dr. Lintner does not say that he writes this from his own observation; and we are left somewhat in doubt as to whether the habits of our mole-cricket differ from those of the European, or whether Dr. Lintner's words, "in a tough sack" are a mistaken rendering of White's "enveloped in a tough skin", or again, whether Rennie or Wood drew merely from imagination. It would be well if some Southern entomologist would clear up this matter.

G. borealis is said to hibernate in the larval condition. The perfect insect appears in May or June. The female then lays her eggs which hatch in one month. She guards her young brood until they come to the second moult, for they have many enemies, among which may be reckoned various kinds of ground beetles.

In some parts of England the mole-cricket is called the "Eve-churr", because of its peculiar note; and Professor Scudder, in an article contributed to the 23rd Report of the Ent. Soc. of Ont., p. 63, compares the call of *G. borealis* to "a guttural sort of sound like grü or green, repeated in a trill indefinitely."

The Field Crickets.

But the crickets with which we are most familiar are the common field-crickets. Of these we have, in the Province of Quebec, at least three easily distinguishable kinds, viz:—

Gryllus neglectus, Scudder.

Gryllus niger, Harris.

Nemobius vittatus, Harris.

The first-named is about two-thirds of an inch long, black, with a brown line along the deflexed border of each wing-cover.

G. niger is a smaller kind. It measures only about half an inch in length. It is jet black. The males are comical little fellows.

Nemobius vittatus is the smallest of the three. It measures only about four-tenths of an inch in length. It is of a dusky brown colour and has three black lines over the head, and a black line along each wing-cover.

Insects of these three kinds are found in great numbers around Quebec. Their notes are produced by stridulation. The wing-covers are slightly raised and the projecting veins of one are briskly grated upon those of the other. The males only produce the sound.

The females lay their eggs in the ground by means of their long ovipositors.

Harris thus speaks of the injuries done by crickets:—"Where crickets abound they do great injury to vegetation eating the most tender parts of plants, and even devouring roots and fruits whenever they can get them. Melons, squashes, and even potatoes are often eaten by them, and the quantity of grass that they destroy must be great, from the immense numbers of these insects which are sometimes seen in our meadows and fields." (Ins. inj. to Veg., p. 151).

The crickets, especially *G. neglectus*, are often troubled with that strange parasite the Hair-snake. The Vice-President of the Quebec branch of our Society observed five of these creatures wriggle away from a cricket that a gentleman had struck down with his walking-stick—*they did not stay upon the order of their going.* The puzzle is, how did they find their way in? This is a greater puzzle than that which perplexed King George III. The monarch—so the story runs—one day entered a farm house, where he was at the time unknown. The owner and his family

were just sitting down to dinner, and hospitably invited the respectable old gentleman, who had walked in, to partake of the meal. The King graciously accepted the invitation. Among the dishes served was one of boiled apple-dumplings. In due course the King took one of these upon his plate. He examined it with interest. He could see no marks of stitches, nor other sign of a junction in the crust ; and, mentally giving up the riddle, he exclaimed "However did the apple get inside the dumpling?"

The hair-snake is certainly found inside the cricket curled round, like the spring of a bird-trap, under the skin of the insect. There it thrives, imbibing the juices of its host ; but how it got there is as yet a mystery.

I have mentioned the ground beetles that feed upon the eggs and young of the crickets. Our largest Quebec species is the Copper-spot Ground-beetle, *Calosoma calidum* Fab. (Fig. 51). The beautiful metallic spots on the elytra of this handsome insect make it easy of recognition. We have other fine beetles of predaceous habits. Amongst them is *Carabus maeander* Fisch., a brown beetle of elegant shape, and with elytra finely sculptured with raised lines and rows of oblong spots. This insect is not uncommon at Quebec, but is rare in other parts of the province. *Cychrus viduus* Dej., is another handsome beetle, purple in colour, with striated elytra, and a large cordate abdomen. This last named species is said to regard slugs and land-snails as high-class food. But,—

Fig. 51. The Copper spot Ground-beetle.

"*Revenons à nos moutons.*"

GRYLLUS DOMESTICUS, LINN (the Domestic Cricket).

During the autumn months of this year a cricket enlivened my house with its nightly serenade. Its place of abode was amid the inequalities between the mantel and the brick-work of the kitchen fire-place : and its favourite position was to stand head downwards, with so much of its body protruded from beneath the mantel as would allow of the free play of its wing-covers. With these appendages constantly vibrating, and with its long antennæ moving backwards and forwards, as if to catch the slightest pulsations in the air that might tell of danger, it would remain for hours. It did not seem to be afraid of light. I could approach warily, lamp in hand, within a yard of it, and watch its motions ; but on the slightest aggressive movement it would dart backward to its retreat. It was about eight lines in length of body, of an ochreous colour with brown and white markings. The veins of the wing covers were brown. The antennæ, palpi, tarsi and abdominal appendages were of a dull yellow. The last named were fringed.

The call of the insect was kept up till the middle of October, when it gradually became fainter and at length ceased.

CEUTOPHILUS MACULATUS, DE GEER (the Wingless Cricket).

A few seasons ago I had the opportunity of watching a wingless cricket as it sent forth its shrill "chirrup." Its hindmost pair of legs were moved up and down rapidly and their spin shanks brought to bear upon the edges of the abdominal plates. The combined friction and vibration produced the notes. The movement reminded me of that of the "up-and-down saw" in an old fashioned saw-mill.

The insect is the *Ceutophilus maculatus* of De Geer, and comes in the Locustaridæ ; but, as Harris calls it "the spotted, wingless cricket," and its call is a cricket's call, it seems fitting to speak of it here.

The creature can be easily recognized by its rounded back, its brown colour mottled or potted with yellow, and its lack of alar appendages.

It is from 6 to 8 lines in length of body, and it has remarkably long antennæ and hind limbs.

There are other creatures that help to swell the concert that in the autumn evenings so deeply impresses us with the sense of the abundance of insect life ; but those we have spoken of—with their violins, banjos, and tambours—are the strength of the musical company.

Erratum.

The Rev. Dr. Fyles drew attention to a printer's error on page 54 of the Thirty-first Annual Report, line 17 from the bottom, where the word "stainy" is printed in place of *satiny*.

NATURE STUDY LESSONS ON MOSQUITOES.

By Prof. W. Lochhead, Ontario Agricultural College, Guelph.

It is unnecessary to state that mosquitoes are interesting for more reasons than the purely scientific. Perhaps no other insect is so well known throughout the wide world, for savage as well as civilized man suffers from its bites. It tortures the Eskimo as much as it does the African or Venezuelan, and makes life almost unbearable at certain stages in the high Arctic regions.

The object of these lessons, however, is more to learn about its habits and life-history than to give information regarding the effects of its bite ; although this latter phase is being studied very closely by scientific men at the present time, for it has been proved that certain species of mosquitoes are able to inoculate man with the organisms of malaria.

The best time to study the life-history of the mosquito is in the summer when the "wrigglers" are abundant in stagnant bodies of water. If a large glass jar be nearly filled with water from pools in marshy places, from ditches where leaves have accumulated, or from exposed rain barrels, a supply of mosquitoes in different stages of development can usually be obtained, and kept conveniently under observation. It would be well to cover the jar with a net of muslin to prevent the escape of the winged mosquitoes as they emerge.

The Eggs. Sometimes curious boat-shaped masses of eggs (Fig 52*a*) may be seen floating on some stagnant water. These should be secured, and put in the glass jar. An egg-mass consists of 200 or 300 spindle-shaped eggs, glued together. It readily rises to the surface if pushed below, and is none the worse of the ducking. It is probable that very few persons have ever seen the female in the act of laying her eggs, but it is supposed that the operation is performed in the early morning hours just before sunrise. The eggs hatch in about twenty-four hours after they are laid. The young "wrigglers," or larvae, make their escape from the underside of the eggs, by the opening of a lid.

The Wrigglers or Larvae. A careful watch over the inhabitants of the glass-jar will show how the wrigglers act. If some of them can be found at rest at the surface, it will be seen that they float with the head downwards, and the end of the body at the surface. (Fig. 52*c*).

At the mouth two tufts of bristles are in ceaseless vibration, and produce a continuous current of water, in which minute creatures are brought within reach as food.

The upper end apparently divides into two branches ; one branch rises to the surface, the other branch, the true hind segment, and the larger branch, serves as a rudder. When a wriggler is disturbed it wriggles away, using the rudder to direct its course. It will be noticed, moreover, that the wrigglers make greater efforts in rising to the surface, than in sinking through the water. This shows that their bodies are heavier than water, and they must have some means of keeping themselves at the surface.

The branch (Fig. 52*c*) which rises to the surface is in reality the breathing tube of the wriggler. The upper end consists of a five-rayed rosette, which is spread out on the surface of

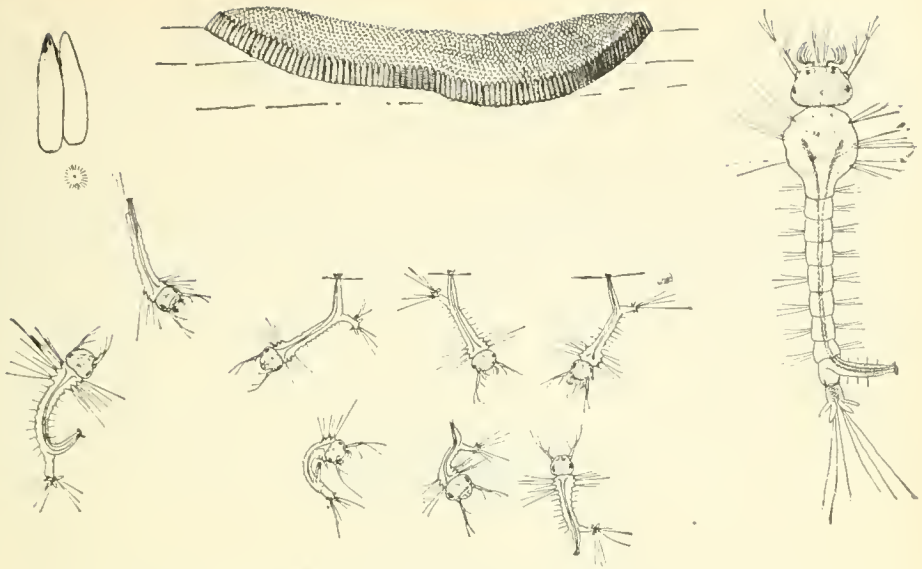


FIG. 52.—*Culex pungens*: Egg mass, *a*, with enlarged eggs at left, *b*, and young larva below, *c* enlarged. (From Howard, U. S. Department of Agriculture.)

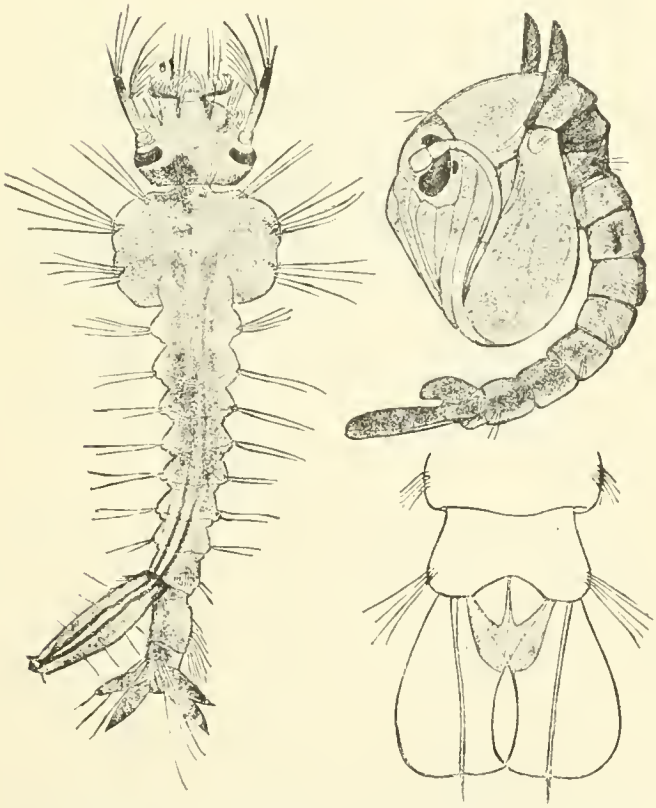


FIG. 53.—*Culex pungens*: Full grown larva at left, *a*, pupa at right, *b*—enlarged appendages of tail of pupa, *c*. (From Howard, U. S. Department of Agriculture.)

water. The tension of the surface film buoys up the rosette, and hence the wriggler itself. Through this breathing tube the insect, gets its supply of air. [Find out how long a wriggler can remain under water without coming to the surface for air.]

In nine or ten days, the wriggler assumes another shape—known as the *pupa*. [Determine how often the wriggler moults in this time.]

The Pupa. They are considerably different in appearance from the true wrigglers. Their head-end is much enlarged (Fig. 53) and the insect is somewhat club-shaped. There is a difference also in their appearance when at rest. The head-end is at the surface, and the supply of air is taken in by two breathing tubes attached to the upper surface of the thorax portion of the enlarged end. Unlike most pupæ, the pupæ of the mosquitoes are active creatures, wriggling about in the water.

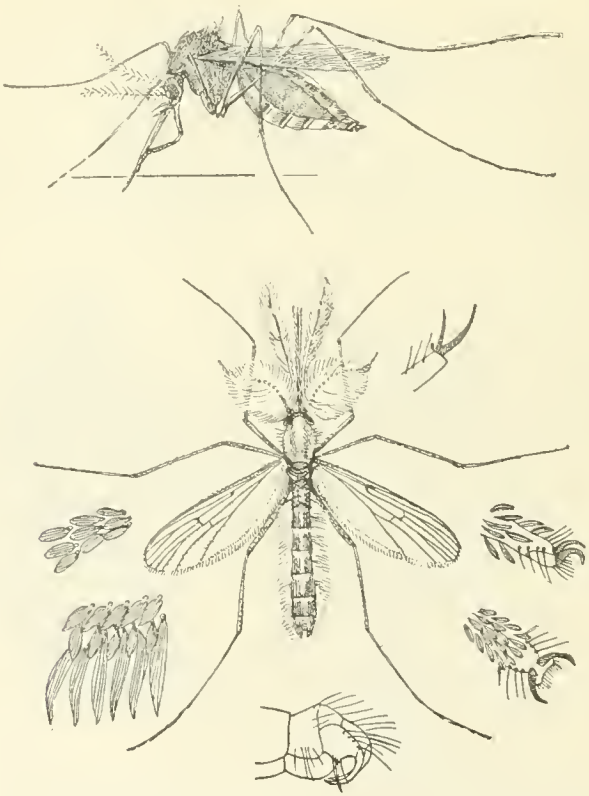


Fig. 54.—*Culex pungens*: Female above, male below,—enlarged. Scales on margin of wing; scales along veins of wing. (From Howard, U. S. Department of Agriculture.)

When a pupa-wriggler is disturbed, it becomes apparent that it makes greater exertions sinking than it does in rising. Its body, then, is lighter than water, and rests naturally at the surface without the aid of a special float.

During this stage, the mosquito develops the wings, legs, and the peculiar stinging mouth-parts, which are of such value to it in the adult stage. The rudiments of the wings and legs may be seen through the pupa-case, if a strong magnifying glass be used. In two or three days, the adult winged mosquito escapes from the pupa-case. (Fig. 54.)

The Adult Mosquitoes. When the time arrives for the emergence of the winged mosquito, the pupa-skin splits along the back, and the insect gradually raises itself on its long spindly legs using the old pupa-skin as a raft. It is nearly bent double as it pulls its wings out, but soon

these become filled, and it is ready to escape. If the wings should get wet during this delicate operation on the unsteady raft, it is more than likely that the poor mosquito perishes. A quiet body of water, therefore, is necessary for the safe emergence of mosquitoes in large numbers.

Male and Female Mosquitoes. The male mosquitoes are readily distinguished from the female by the long-feathered antennæ. The males neither sing nor bite, and if they feed at all it is on the juices and nectar of plants. It is quite probable that the normal food of these insects is the juices of plants, but it is also quite certain that the females delight in the warm blood of animals, including man.

The Wings. Mosquitoes have but one pair of wings. The margins of the wings are fringed with hairs, and the veins with minute scales. The buzz-sound of the mosquito is made by the rapid vibration of the wings, about 3000 in a minute, and by the air passing over little drums at the openings of the air tubes of the sides of the body. The hind wings are represented by a pair of stalked knots, called "balancers."

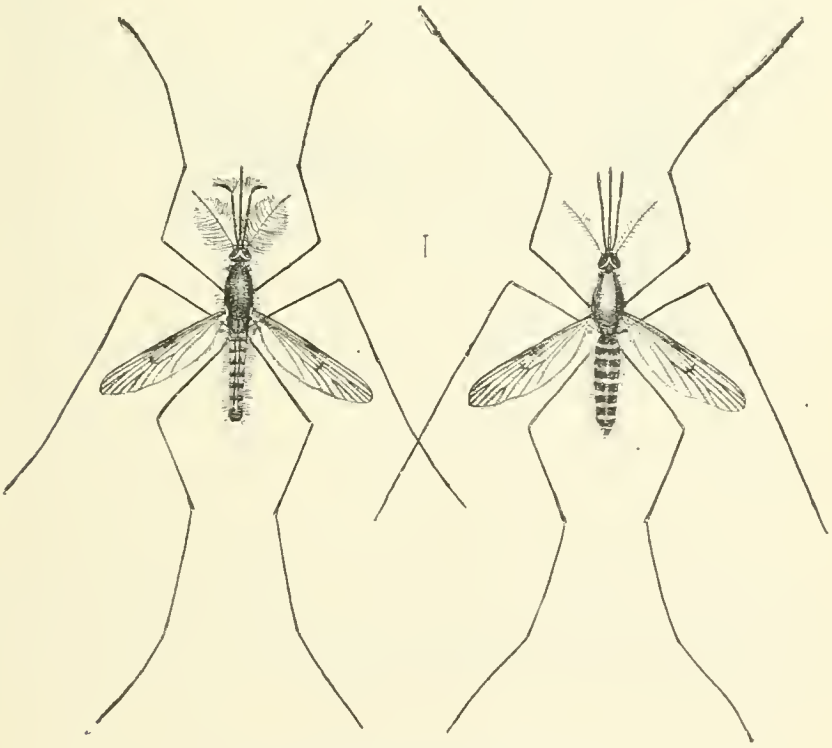


FIG. 55.—*Anopheles quadrimaculatus*: Adult; male at left, female at right—enlarged. (From Howard, U. S. Department of Agriculture.)

The Mouth Parts. These are to many persons the most interesting portion of the anatomy of the mosquito. The mouth-parts of the males are simpler than those of the female, and consist of but three parts, the sucking proboscis and the two palpi, one on either side of the proboscis or sucking-tube.

The females have a long slender upper lip, five slender lances, and a large proboscis with two short palpi (Fig. 55). When a female mosquito alights on the skin, she pierces it with the

"bill" composed of the upper lip and the five slender lances, and the blood is drawn up through the proboscis into the stomach.

Kinds of Mosquitoes. There are several genera of Mosquitoes, two of which are common, viz., *Culex* and *Anopheles*. The former, however, is by far more abundant, and the species *pungens* is the *Common Mosquito*.

Anopheles is important as it is the agent in the inoculation of the human body by malaria. The female Anopheles may be distinguished readily from the female Culex by the length of the palpi on each side of the proboscis. In the former the palpi are almost as long as the proboscis, while in the latter they are quite short. (Fig. 55.)

The resting position of mosquitoes is an interesting study, which may be carried on both summer and winter. In winter the adults cling to the ceilings of attics and basements. [What is the characteristic resting attitude of Culex on the ceiling and the vertical wall?] (Fig. 56.)

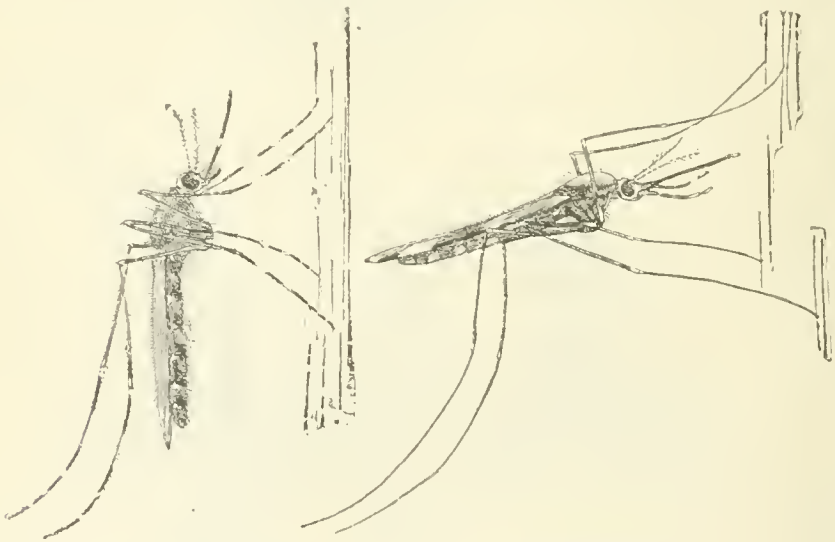


Fig. 56.—Resting positions of Culex (at left) and Anopheles (at right), enlarged (redrawn from a rough sketch published in the British Medical Journal. (From U. S. Department of Agriculture.)

How to rid a locality of Mosquitoes. Dr. Howard, of Washington, mentions three methods: 1. "By the drainage of the swamps or pools in which the mosquitoes breed." 2. "By the use of kerosene on the surface of the waters in which they breed." 3. "By the introduction of fish into fishless ponds so that they may eat the wrigglers."

Practical Exercises.

1. How far do mosquitoes fly from their breeding places?

2. Collect a large number of mosquitoes during the summer, and determine, 1. the number of males, 2. the number belonging each to Culex and to Anopheles.

3. The effect of the use of Kerosene on the breeding places of mosquitoes (use 1 oz. for every 15 sq. ft. of surface).

4. Full-study of life-history of Culex.

ENTOMOLOGICAL RECORD, 1901.

By Dr. James Fletcher, Ottawa.

Canadian students of Entomology, in the past, have had many obstacles to overcome before they could advance sufficiently in their studies to obtain that encouragement which is necessary to incite continued effort. Congenial companionship is undoubtedly the greatest and most useful help that any student can be blessed with in any line of research. It is manifestly of great advantage to know who is working at the same studies as ourselves and what others are doing, so as to correspond, compare notes and learn as soon as possible all that is to be known about any subject in which there is a mutual interest. We all know how the accidental capture of a rarity, or a chance incident, may direct our particular attention to some class of insects or some entomological problem which but for this accident might never have come before us.

Having for many years felt the want of this information, it has occurred to me that if there were published every year in the Annual Report a record of the important entomological events of the year, it would be of considerable use to every one interested in Canadian entomology. The plan of this Entomological Record may well, I think, be discussed by the members, and I shall be very glad to receive suggestions as to the most useful way of preparing it in future. The kind of information which it seems to the writer would be of use, will fall under the following heads:— (1) A record of special rarities taken by collectors, with the various localities and dates, which for ease of reference should be arranged under their natural orders and in the sequence of some recognised check list. (2) The names of specialists who have devoted particular attention to some order, genus, species, or phase of entomological study. (3) The names of any books of note affecting entomology, or connected with any branch of it, which may have been published during the year.

It is not proposed to include in this record, except perhaps in an incidental manner, facts connected with Practical Entomology. This subject will be fully treated of in "Notes of the Year" and other papers included in the Report.

The compilation and preparation of this Record need not always be done by the same person. I merely on this occasion submit a short outline or scheme, as a beginning, and, if my opinion as to its value is correct, I feel sure that year by year it will be improved in form. As soon as collectors and workers in entomology know that this will be a regular annual record, they will themselves send in notes of their work and requests for information, which will make it continuously more and more useful; indeed it will be better, that this record should not be always prepared by the same person when the final form in which it should be drawn up, has been decided upon, and I would suggest that at each annual meeting the council should request someone to undertake the work for the ensuing year, and then publish their choice, with the address of the compiler, in the "Canadian Entomologist" for January each year, so that collectors may know to whom records should be sent. These records of captures, or requests for information, should be sent in from time to time, and should not be held over until the end of the year, or there is great danger of their being forgotten.

Needless to say, every care must be taken that the identification of all species mentioned should be as accurate as possible, and doubtless considerable correspondence may be required and in some instances specimens may have to be examined; all this takes time, and will show how inconvenience may arise from records being sent in at a late date before the annual meeting.

In the meantime I shall be glad to receive notes on the above mentioned subjects, or advice as to improvements for the Record of 1902. The present article is merely suggestive—a beginning—and may be changed and improved to an unlimited degree.

The Season of 1901.

The season of 1901 in almost all parts of Canada has been characterised as "poor" by nearly all collectors heard from. Of those who have favoured me with notes, there are only two who have made satisfying collections, either as to species or as to numbers of specimens, viz. Mr. A. F. Winn, of Montreal, Que., and Mr. J. D. Evans, at Trenton, Ont. Such reports as "The poorest year I have ever known," "Remarkable for the absence of good species", "I never took so few good things", "Insects of all kinds scarce", etc., are almost universal. The only exceptions to this general statement in the reports received, were with regard to the unusual abundance in the West of *Pyrameis cardui* and *P. atalanta* and through the whole of Canada of *Pieris rapæ*. In all parts of Ontario, the noticeable insect of the season was the Birch-Tree Skeletonizer (*Bucculatrix canadensisella*). In Manitoba and the North-west Territories the moths of *Noctua clandestina* were found during July in myriads inside houses, to which they had doubtless been attracted by lights.

Literature.

Bibliographical notes on entomology appear regularly in all entomological journals and scientific magazines, such as "The Canadian Entomologist," "The Ottawa Naturalist," "Entomological News," "The American Naturalist," "Science," etc. These are all indispensable to the working entomologist.

Howard (L. O.)—"The Insect Book." An event of very great importance as affecting the whole subject of entomology is the recent publication of Dr. Howard's "Insect Book." Up to the present time, the one great obstacle in the way of lovers of natural history devoting their attention to the study of insects, was the fact that there was no single elementary work of moderate price, which would enable a beginner to identify and classify his captures. This want has been to a large measure supplied by Dr. Howard, with his most useful work. Copiously illustrated and written in untechnical language, it has already commended itself to a great many beginners, especially boys and girls, and will I feel confident, together with Dr. Holland's beautiful "Butterfly Book," do more to attract students to entomology as a recreation and study, than all the works which have preceded it. Beginners have now a starting point from which they can easily make an appreciable advance towards a knowledge of most of our common forms of insect life. The beetles and moths are now the only insects requiring treatment in the same manner, and it is to be sincerely hoped that before long this lack will also be supplied. Some deficiencies of minor importance, in the Insect Book, due to hurried publication, will doubtless disappear in the next edition.

Important monographic works will be dealt with under the Orders of insects to which they refer. Mention, however, may be made here of the splendid report by Prof. J. G. Needham, of Lake Forest University, Illinois, on the "Aquatic Insects of the Adirondacks," lately issued by Dr. E. P. Felt, State Entomologist of New York, a charming report of excellent and original work in an almost unworked field, and one which is very suggestive as to desiderata, with regard to which facts may be supplied by workers in all parts of the country. A valuable feature of this work, as in the Insect Book, is the number of suggestions which are made as to useful lines of work which may be taken up to supply unknown data in the lives of well known insects.

General Collectors.

Most collectors of insects, as their material accumulates, specialize their efforts and devote their attention to one or two orders. There are a few, however, who keep up their general collections and who are always glad to correspond and exchange specimens in all orders. This, of

course, is the case with the curators of public institutions, such as museums, colleges and schools. In addition to these the following are active workers in Canada :

Begin, Rev. P. A., Sherbrooke, Que.
Bethune, Rev. C. J. S., London, Ont.
Coubeaux, Eugene, Prince Albert, Sask.
Desrochers, Rev. J. E., Rigaud, Que.
Evans, J. D., Trenton, Ont.
Fyles, Rev. Thos. W., Levis, Que.
Gregson, Percy B., Waghorn, Alta.
Huard, Rev. Victor, Quebec, Que.
Lochhead, Prof. W., Guelph, Ont.
McIntosh, Wm., St. John, N. B.
Stevenson, Charles, Montreal, Que.

It will be noticed that most of the notes collected for this year's record are on the work of lepidoterists and coleopterists. A short report has kindly been prepared on Orthoptera by Mr. E. M. Walker, of Toronto, and data have been supplied for that on Hymenoptera, by Mr. W. H. Harrington, of Ottawa. Several collectors are devoting some attention to Diptera and Hemiptera, and it is hoped that by next year this material may provide data for a more extended notice of work in these orders, than is possible now. Canadian collectors are under deep obligations to the leading specialists in the United States, who at all times have most generously named material from all localities, whenever sent.

General collectors of insects frequently ask for a list covering all orders of insects, so that they may know how to arrange their collections. In most orders there is some one check list which is recognized generally ; this should be used in arranging a collection. Probably the best general list covering all orders is Dr. J. B. Smith's "Insects of New Jersey," which is a catalogue up to 1899, of all insects found in that State.

Lepidoptera.

By far the largest number of notes received refer to the Lepidoptera. For that reason, on this occasion, these insects will receive first attention. Species are referred to, not always for their great rarity, but when it is thought that a note of the occurrence in a certain locality, or upon a certain date, may prove of interest to other collectors. The species are mentioned in the order of Dr. J. B. Smith's "List of the Lepidoptera of Boreal America," 1891. Of works relating especially to Lepidoptera which have appeared in 1901, first mention should be made of Mr. Beutenmüller's beautiful "Monograph of the Sesiidae of America North of Mexico," published as a Memoir of the American Museum of Natural History, with eight magnificent plates. By the same author is a very useful "Descriptive Catalogue of the Noctuidæ found within Fifty Miles of New York City." During the year several valuable articles containing descriptions of new species have appeared, by Prof. J. B. Smith, of New Jersey, and Dr. H. G. Dyar, of Washington.

The following list gives the names and addresses of some of the most active students of Lepidoptera in Canada. There are doubtless many others, but I have not been able to learn what they have been doing during 1901 :

Anderson, E. M., Victoria, B. C.
Bethune, Rev. C. J. S., London, Ont.
Boger, H. W. O., Brandon, Man.
Brainerd, Dwight, Montreal.
Bush, A., Vancouver, B. C.
Cockle, J. W., Kaslo, B. C.
Criddle, Norman, Aweme, Man.
Danby, W. H., Rossland, B. C.
Dennis, A. J., Beulah, Man.
Dod, F. H. Wolley-, Calgary, N. W. T.
Evans, J. D., Trenton, Ont.
Fyles, Rev. Thos. W., Levis, Que.
Fletcher, James, Ottawa.
Gibson, Arthur, Ottawa.
Grant, C. E., Orillia, Ont.
Gregson, Percy B., Waghorn, Alta.
Hanham, A. W., Victoria, B. C.
Harvey, R. V., Vancouver, B. C.
Heath, E. F., Cartwright, Man.
Johnston, James, Bartonville, Ont.
Jones, W. A. Dashwood-, New Westminster, B.C.
Lyman, H. H., Montreal.
McIntosh, Wm., St. John, N. B.
Marmont, L. E., Rounthwaite, Man.
Moffat, J. Alston, London.
Norris, A. E., Montreal.
Richard, A. E., Ottawa.
Sandercock, W. C., Lauder, Man.
Suffield, J. D., Morden, Man.
Taylor, Rev. G. W., Wellington, B.C.
Venables, E. P., Vernon, B. C.
Winn, A. F., Montreal.
Wilson, E., Vancouver, B.C.
Wilson, T., Vancouver, B.C.
Willing, T. N., Regina, Assa.
Young, C. H., Hurdman's Bridge, Ont.

Of the above named, the following have made specialties of some subjects: Messrs. Brainerd, Cockle, Fyles, Fletcher, Gibson, Lyman and Young have given much attention to and are keenly interested in rearing species from the egg to the perfect insect. The Division of Entomology of the Experimental Farms is particularly interested in working out the life histories of insects, and will be grateful for all eggs or larvæ, which may be sent in by correspondents, particularly of Arctiidæ, and also of Acronycta, Agrotids and diurnals.

There are now many more interested in the study of insects than was the case a few years ago, and naturally the members of our Society have taken an active part in bringing their favourite field of research before others. Excellent work has been done by Mr. H. H. Lyman, in Montreal, by the encouragement he has always given to the members of the Montreal branch. In this work he has been ably assisted by several of the other members, notably by Mr. A. F. Winn. Similar good work has been done in St. John, N.B., by Mr. Wm. McIntosh, in Quebec by the Rev. Thos. W. Fyles, and in Vancouver by Mr. R. V. Harvey. In London the Rev. C. J. S. Bethune has put new life into the local branch. Too much cannot be said of the courtesies of Mr. J. Alston Moffat, the efficient curator of the Society's collections, to whom all our active collectors are frequently under obligations in many ways. The Toronto Branch has, during the past year, made material progress in arranging the collection of insects presented by them to the Education Department for Ontario.

Notes on Captures.

RHOPALOCERA. Melitæa harrisii, Scud. Fairly common in one locality at Orillia. (Grant.)

Phyciodes batesii, Reak. This species, which is much rarer than *P. tharos*, occurs at Ottawa and Aylmer, Que., a week or ten days sooner than the latter species. (Fletcher.)

Euptoieta claudia, Cram. A female of this species was taken at Regina on July 10, while in the act of laying its eggs on *Linum sulcatum*. Four eggs were seen to be deposited on separate plants, so that this flax, a curious food plant for an Argynnid, seems to be the natural food of the caterpillars in that district. It is also known to feed on violets, and has even been troublesome in gardens in the West from attacking pansies.

Grapta satyrus, Edwards. A fair specimen that had wintered. May 5, Orillia. (Grant.) This species is rare east of the Rockies, but very common on the Pacific coast.

Vanessa californica, Bdv. A few specimens. New Westminster. (Jones.) This butterfly is very seasonal in its appearance. It was reported as swarming in the mountains round Kaslo, B.C., by Mr. Cockle, last year. A few specimens high up on Mount Che-am in the middle of August, where it was very troublesome in disturbing more desirable species. (Fletcher.)

Junonia cænia, Hbn. A fairly good specimen in a cutting on the railway. Orillia. (Grant.)

Limenitis weidemeyerii, Edw. One or two specimens of this species were found in the collection of Mrs. Walton, at Armstrong, B.C., where she had collected them.

Debis portlandia, Fabr. A few specimens of this butterfly have been taken at Ottawa in 1901, July 10. (Richard.)

Erebia vidleri, Elwes. In addition to the six previously known examples of this fine species, about two dozen more were taken on the 15th and 16th August last on Mount Che-am, B.C., by the writer and Messrs. A. Bush and T. Wilson, of Vancouver.

Hipparchia ridingsii, Edw. Regina, July 10. (Fletcher.) This species has also been taken in some numbers at Aweme by Mr. Criddle.

Chionobas jutta, Hbn. Mer Bleue, near Ottawa, May 31. (Gibson.)

Thecla nelsoni, Bdv. Not uncommon at Kaslo in spring. (Cockle.) This is the first record of the species being found in Canada.

Chrysophanus xanthoides, Bdv. Brandon, Man. (Boger.) Several specimens.

Lycaena sapiolus, Bdv. This common western species seems to be gradually extending eastward. Four years ago a single specimen was taken at Nepigon. Last year in the beginning of July it simply swarmed in localities where in previous years, although visited at the same time of the year, no trace of it was seen. (Fletcher.)

Lycæna couperii, Grt. This species has never been recorded for western central Ontario, but Mr. A. W. Hanham writes that he took several specimens May 17, 1891, "two miles up from Brantford, close to the Grand River, via the Paris River road." Collectors in western Ontario should be on the lookout for the species.

Lycæna shasta, Edw. Some years ago Mr. F. H. Wolley-Dod took a single specimen 24 miles south of Calgary, but the species then disappeared. During the past summer he was fortunate enough to secure three or four more specimens. The locality seems rather far from the mountains for this species, and it is probably the farthest eastern limit in Canada. The altitude of Calgary is about 3,400 feet above the sea level.

Lycæna comyntas, Gdt. One specimen at Aylmer, Que., June 6, the second record only in the Ottawa district. (Gibson.)

Neophasia menapia, Feld. The mode of occurrence of this species in British Columbia is very remarkable. In certain years it swarms in countless myriads, the caterpillars feeding on the coast upon the foliage of the Douglas Spruce, but in the interior on the Bull Pine, *Pinus ponderosa*. Towards the end of the season, in August, the dead butterflies may be seen in vast numbers floating on the sea around Vancouver Island, or thrown up along the beach in windrows sometimes an inch or two in depth. A few specimens were seen flying in the Nicola valley on August 18 (Fletcher), and Mr. Dashwood-Jones reports that a few specimens were also taken at New Westminster.

Pieris protodice, B.-Lec. One specimen flying around golden-rods Sept. 21. The first record for Ottawa. (Fletcher.)

Colias eurytheme, Bdv. Remarkably abundant at Orillia. (Grant.) A few at Ottawa in September. (Young.)

Colias christina, Edw. Langvale, Man., June 5. (Sandercock.)

Pamphila hobomok, Harr. I have endeavored to hear of any instance of true *P. zabulon* being taken in Canada, but so far have failed. The differences between these two species are well shown by Dr. Skinner on plate 19, Entomological News, Vol. X. It would be well if Canadian collectors would examine their specimens and see if we have *P. zabulon* in Canada.

Eudamus bathyllus, S. & A. Three specimens of this butterfly, which differs from the somewhat similar *E. pylades*, Scud., by the absence of the sexual costal fold in the males, were taken by Mr. James Johnston at Hamilton, last year. Although frequently recorded from Canada, I believe that these are the first specimens which have been examined critically.

Pyrgus tessellata, Scud. A fine fresh specimen at Orillia Park, Sept. 21. (Grant.)

HETEROCERA.

Lepisesia ulalume, Strk. This rare and beautiful species has been taken several times at New Westminster by Mr. Dashwood-Jones. Mr. Harvey took a specimen this year at Vancouver. Whether it is a true species or merely a western representative form of *L. flavofasciata*, Barnst., requires investigation. Specimens of *ulalume* in some instances show very little of the black collar and have the secondaries more or less clouded with yellow. As a rule, the western form is larger than *flavofasciata*, but seems to bear the same relation to it that *Nisoniades juvenalis* does to *N. propertius* of the West.

Sphinx canadensis, Bdv. Two fine specimens of this rare hawkmoth were taken at Ottawa, June 10 and 12. Mr. Gibson, the captor, recognizing them as different from anything he had seen before, even on the wing.

Ampelophaga versicolor, Harr. Montreal, July 14. (E. D. Wintle.)

Smerinthus cerisyi, Kirby. A beautiful specimen at light, Orillia, May 20. (Grant.) Trenton. (Evans.) Rare in Eastern Canada.

Sannina exitiosa, Say. St. John, N. B. (McIntosh.) As no peaches are grown at St. John this record is interesting.

Alypia Mac-cullochii, Kirby. Montreal Island, June 1. (Stevenson). This is an interesting record. The species is common in the far East, whence it was described, also at Nepigon and in the Rocky Mountains. I have several times found the larvæ on *Epilobium angustifolium* at the latter localities and obtained the moths the following spring.

Heterocampa marthesia, Cram. A beautiful specimen of this fine moth was bred from a larva found on the ground in a beech wood at Ottawa during Sept. 1900. The moth appeared the following June. (Fletcher.)

Heterocampa bimidata, Walk. A fine female was taken at light June 15, Ottawa. (Fletcher.)

Eacles imperialis, Dru. Two at light. "I never came across this till 1900." Orillia, June 24. (Grant.)

Hepialus sequoiolus, Behr. A fine specimen of this rare species was taken at Vancouver by Mr. E. Wilson ; it has been previously taken at Victoria by Rev. G. W. Taylor.

Hepialus mustelinus, Pack. One specimen, St. John, N B. (McIntosh.)

Euthyatira pudens, Gn. One at light, the peach-blossom tint very pronounced. May 2, Orillia. (Grant.)

Semiophora youngii, Sm. ms. This new species was reared from the larva and collected by Mr. Young last season. Mer Bleue, near Ottawa. Aug. to Sept. (Young.)

Peridroma astricta, Morr. Kaslo, B. C. (Cockle.) Mr. Cockle sent eggs to Ottawa under date July 30. The larvæ were full grown in October. Cartwright, Man. (Heath.) Specimens sent by Mr. McIntosh from St. John, N. B., were identical with the western form.

Noctua substrigata, Sm. A fine specimen taken at Brandon. (Boger.)

Feltia robustior, Sm. A specimen of this newly described species was taken at Brandon. (Boger.)

Carneades quadridentata, G. & R. This species was recorded in Bull. 18, 1899, Nat. Hist. Soc. of N. B., by W. McIntosh (teste H. Strecker), "but the species has proved from better specimens submitted to Prof. J. B. Smith to be *C. detersa*. Three specimens were taken in 1901." (McIntosh). *C. detersa* is a widely distributed species and under the name of *C. pitychrous* is included in many lists.

Mamestra rugosa, Morr. Mer Bleue, near Ottawa, May 31. (Gibson.) A remarkably bright specimen, the first Ottawa record. Two specimens, St. John. (McIntosh.)

Carneades mollis, Wlk. (*C. fernaldi*.) Two or three specimens mid-July. (McIntosh.)

Homohadena badistriga, Grt. Several specimens bred from larvae found on honeysuckle. Ottawa. (Fletcher.)

Oncocnemis atrifasciata, Morr. A fine specimen of this beautiful moth, St. John, N. B. (McIntosh.) Rounthwaite, Man. (Marmont.)

Prodenia lineatella, Harv. Ottawa, October. (Fletcher.) Trenton. (Evans.)

Eupsephopectes procinctus, Grt. This fine noctuid (two or three specimens) was taken at "sugar" at Brandon, Man., by Mr Hanham. Several specimens were bred by Messrs. T. Wilson and A. Bush, from troublesome cutworms feeding on vegetables in gardens at Vancouver, B. C., in company with *Peridroma saucia* in 1900.

Gortyna arata, Lyman, n. sp., described in Can. Ent. XXXIII, No. 12, p. 319.

Achatodes zea, Harr. Several specimens of this neat little moth were bred from caterpillars boring in the young shoots of elder, *Sambucus*. Kingston and Ottawa. Imagoes July 6. (Fletcher.)

Taeniocampa oviduca, Grt. Trenton, rare. (Evans.)

Scopelosoma devia, Grt. St. John, N. B. (McIntosh.) One specimen. Had previously been taken here once before, May 15 ,1898.

Xylina thaxteri, Grt. One specimen Ottawa Apl. 23. (Young.)

Plusia thyatiroides, Gn. At light Aug. 24, Orillia. (Grant.) St. John. (McIntosh.)

Plusia dyaus, Gat. At flowers in town park, Orillia, Oct. 10. (Grant.)

Plusia flagellum Walk. St. John, N. B. (McIntosh.)

Catocala elda, Behrens. A few specimens, New Westminster. (Jones.) Vancouver. (Bush. This beautiful species which resembles the European *C. fraxini* much more than the American *C. relicta*, of which it is supposed to be a variety, was bred by the Rev. G. W. Taylor many years ago from a larva found at Victoria on Oak.

Erebus odora, Linn. This strong-winged wanderer from the West Indies has this year been reported from as far west as Calgary, where a specimen was taken by Miss Moodie of that place. Last year Mr. Hanham secured one at Winnipeg, and Mr. Dennis another at Beulah, Man. Mr. Grant took a perfect female "at sugar" at Orillia, July 6.

Homoptera woodii, Grote. "A beauty, at sugar," June 10, Orillia. (Grant.)

Leucobrephos middendorfi, Men. A pair of this rare and interesting moth taken at Aweme, Man., early in the spring, "extremely difficult to see and to follow." (Criddle.)

Varieties.

Argynnis lais, Edw. Some beautiful suffused varieties of this species have been taken at Aweme by Mr. Criddle, and during the past summer a handsome specimen somewhat resembling the figure of *A. platina* shown on plate 13, Ent. News, XII, No. 10, was taken at Beulah, Man., by Mr. Dennis. This specimen has three large basal silver blotches and a sub-marginal band of large silver spots. The primaries are more suffused with black than in the figure referred to. A fine painting of this and Mr. Criddle's own specimens were exhibited at the annual meeting.

Vanessa Antiopa, var. *Lintneri*, Fitch. A fine specimen, with very wide border was this year bred at Ottawa, July 10th. This is not a true variety, but merely an accidental form which can be produced at will. (Fletcher.)

Lycæna neglecta, Edw. Mr. A. F. Winn caught last year at Bideford, Maine, on July 14th, a very fine gynandromorph of this species, the left side of which was female and the right male.

Coleoptera.

There are many who are collecting beetles in Canada, but, unfortunately, few records have been received, compared with those which have come to hand from lepidopterists.

The following are the names of some of the most active collectors:

Bethune, Rev. C. J. S., London, Ont.
Chagnon, Gus., Montreal, Que.
Crew, R. J., Toronto.
Evans, J. D., Trenton, Ont.
Fletcher, J., Ottawa, Ont.
Hanham, A. W., Victoria, B.C.
Harrington, W. H., Ottawa, Ont.
Keen, Rev. J. H. Metlakatla, B.C.
McIntosh, Wm., St. John, N.B.
Taylor, Rev. G. W., Wellington, B.C.

Mr. Keen has sent few records this year, but no one has done more to increase our knowledge of rare species from the extreme north-west coast than he has. He collected assiduously

for many years on the Queen Charlotte Islands, and has recently moved to his present address.

NOTES OF CAPTURES.

Cicindela limbata, Say. Reported by Mr. Hanham as found on the sand hills bordering the Douglas swamp, Man., on June 18, 1899. "They looked like large white spiders skimming over the sand. I found them copulating buried in the sand, with just their heads showing."

Cicindela pusilla, Say. This rare species was taken by Mr. L. E. Marmont, at Rounthwaite, Man., and also by Mr. Hanham, at Bird's Hill, near Winnipeg, in 1900.

Cychrus tuberculatus, Harr. This rare and handsome species is occasionally taken in Vancouver Island. Comox, B.C. (Taylor, Fletcher, and Prof. J. Macoun.) The Rev. J. H. Keen found it not uncommon at Massett, on Queen Charlotte Islands. Two fine specimens were taken at Coldstream, twelve miles from Victoria, in June last. (Hanham.) The food of beetles of the genus *Cychrus* is generally stated to be snails, but Mr. Hanham writes: "I have found *Cychrus angusticollis* and *C. marginatus* in colonies in rotten stumps evidently preying upon slugs, which were with them. I think, for every snail they get here, they get one hundred slugs. I have caught *C. marginatus* in my garden feeding on slugs."

Cychrus angulatus, Harr. This very rare species has been again taken on Vancouver Island by the Rev. G. W. Taylor. Superficially, it resembles the black form of *C. angusticollis*, but has the thorax differently shaped, and the punctuation and striation of the elytra are quite different. "Near Brenman Creek, July 1, I have only seen three in nineteen years." (Taylor).

Carabus nemoralis, Mul. This interesting carab was first recorded by Dr. Horn as a Canadian species in 1891. Later in the same year Mr. Harrington took several specimens at St. John, N.B., associated with another European species, *C. granulatus*, Dej., and published a note in the Canadian Entomologist, 1891, p. 112. Mr. McIntosh now finds both of these species abundant at St. John, and speaks of *C. granulatus* as our commonest ground beetle.

Pasimachus elongatus, Lec., taken not uncommonly at Aweme. (Criddle.) Under stones in the Brandon Hills. (Hanham.)

Clivina pallida, Say. St. John, N.B., rare. (McIntosh).

Dicaelus sculptilis, Say. "This species was not uncommon in Winnipeg in 1894. I have not seen a specimen since." (Hanham.)

Platynus clemens, Lec. Rare in Canadian collections. Originally described from Nova Scotia. St. John, N.B. (McIntosh.)

Platynus hardyi, Lec. This beetle has been taken on the sea shore in Nova Scotia in former years by Mr. Harrington; also, in numbers along the Nepigon River. (Fletcher.) Common, St. John, N.B., 1901. (McIntosh.)

Chlaenius purpuricollis, Rand. One specimen taken at Brandon, September 27, 1900. Another was taken on almost the same spot, April, 1897. (Hanham.)

Chlaenius interruptus, Horn. "In May, 1898 and 1899, this species was abundant along a short piece of railway line, two or three hundred yards, near Winnipeg." (Hanham.)

Tanyrhinus singularis, Mann. One flying October 24, 1898. Gabriola Island. B. C. (Taylor.) Massett, Q.C.I. (Keen.)

Adranes taylori, Wick. Two or three found in April and May in the nest of a yellow ant, Gabriola Island and Nanaimo. (Taylor.)

Mysia hornii, Cr. A few on currant bushes, Gabriola Island. (Taylor.)

Aphorista lata, Lec. Under bark of alder and hemlock, March to May, Nanaimo. (Taylor.)

Mycetina hornii, Cr. Nanaimo, May 22. One under bark of fallen fir, April 30. (Taylor.)

Perthalycra murrayi, Horn. Nanaimo, May 22. (Taylor.)

Derodontus trisignatus, Mann. In fungi, Wellington, B.C., November. (Taylor.)

Nosodendron californicum, Horn. About 20 in a crevice of bark of *Picea grandis*, May 13th, Wellington. (Taylor.)

Acmaodera pulchella, Hbst., and *A. culta*, Web. Specimens of these pretty little Buprestians were taken on the flowers of Butterfly Weed, *Asclepias tuberosa*, at Komoka, Ont., July 13. (Bethune.) Neither of these species had previously been recorded from Canada.

Chrysobothris pusilla, Lap. and Gory. Ottawa, rare. (Fletcher, Harrington.) St. John, N.B. (McIntosh.) One specimen in each case.

Endeodes collaris, Lec. A few specimens of this rare species were taken by Rev. G. W. Taylor at Victoria.

Listrus motschulskii, Lec. Common on blossoms of Amelanchier at the end of April, Wellington, (Taylor.)

Polycaon stoutii, Lec. One specimen in twig of apple tree, Nanaimo, (Taylor.)

Molorchus longicollis, Lec. One on crab blossom, Gabriola Island, May 25. (Taylor).

Ulochates leoninus, Lec. Two specimens on July 2 and 14, Nanaimo, and Gabriola Island. (Taylor.) Vernon, B.C. (Fletcher.)

Acanthocinus obliquus, Lec. Quite common on a fence near poplars, August and September, 1899; not seen since. (Taylor.)

Pachyta armata, Lec. Four specimens of this handsome beetle were taken flying round flowers, at an altitude of 7,000 feet, on Mount Che-am, B.C.; August 15. (Fletcher.)

Anthophylax malachiticus, Hald. Six specimens flying low in a beech wood, Aylmer, Que., 1900, and eight specimens in the same place, June, 1901. (Fletcher.)

Anthophylax attenuatus, Hald. Three specimens, St. John, N.B., July. (McIntosh.) Ottawa, very rare; one specimen, June. (Young.) Another specimen was taken at Ottawa many years ago by Mr. Harrington.

Anthophylax mirificus, Bland. Both sexes. Vernon, B. C. (E. P. Venables.)

Leptura Matthewsii, Lec. Pine Creek near Calgary (Wolley-Dod). Vernon, B.C. (E. P. Venables)

Priognathus monilicornis, Rand. A widely distributed but usually rare Œdemerid. One specimen under log, St. John. (McIntosh.) Several flying in May, Wellington, B.C. (Taylor.)

Rhinosimus pallipes, B. and L. One only, April, 24. (Taylor.)

Asclera nigra, Lec. Gabriola Island; four specimens. May 13-15. (Taylor.)

Orchesia ornata, Horn. One on apple blossoms, May 4: Gabriola Island. (Taylor.)

Hymenoptera.

Some good work has been done in this order during the season. The most active workers have been the following: Mr. W. H. Harrington, of Ottawa, who continuously adds to his own extensive collections and has also done good work in the way of identifying specimens and helping others. The writer gratefully acknowledges many favours in the determination of parasites bred from larvæ collected in the field and from scale insects. Mr. Chagnon, of Montreal, continues his studies of this order, and Rev. G. W. Taylor, of Wellington, Vancouver Island, has also added considerably to the knowledge of British Columbian Hymenoptera.

The attention of our own members may be profitably directed to the recent systematic work of Mr. W. H. Ashmead, of Washington, undoubtedly the highest authority on American forms. His monographic writings have added immensely to the knowledge of these insects, and his recent scheme of classification marks a great advance upon that of Cresson, published in 1887. It has been adopted by Howard in his admirable "Insect Book." Such portions of the

classification as have appeared must be carefully studied by all workers in this vast and difficult, but most interesting order. Ashmead divides the Hymenoptera into ten superfamilies, viz., *Apoidea*, *Sphecoidea*, *Vespoidea*, *Formicoidea*, *Proctotrypoidea*, *Cynipoidea*, *Chalcidoidea*, *Ichneumonoidea*, *Siricoidea*, *and Tenthredinoidea*. These are subdivided into ninety-four families. The parts of the classification already published are the following :—(1) The Ichneumonoidea, by the United States National Museum (Proc. XXIII., No. 1206), in which over eleven hundred genera are tabulated. (2) The Apoidea, in Trans. Am. Ent. Soc'y., 1899. (3) The Sphecoidea in the Canadian Entomologist for 1899 and (4) The Vespoidea (in part), in the same publication in 1900. The continuation of this most important and satisfactory work will be welcomed by all interested. It is much to be regretted that a larger number of our Canadian entomologists do not devote more attention to the Hymenoptera. Most attractive fields of study, with ample room for original observations, are offered in each superfamily, especially in connection with the social groups of bees, wasps, and ants, as well as in the great complex of parasitic species which play such an important role in the control of injurious insects in all orders. We trust that next year's record may be able to show that some useful work has been performed in this fertile field.

Among interesting captures mention may be made of the following :—

Baus niger, Ashm. Reared at Ottawa from a batch of spider's eggs ; 4 males and 20 females. (Harrington.)

Hecabalus lycti, Cresson ; and *Hecabalus utilis*, Cresson. Reared in large numbers at Ottawa from axe handles infested by the Powder-post Beetle (*Lyctus unipunctatus*). The parasites most abundant in June and October. (Fletcher.)

Abia kennicotii, Nort. One specimen at Trenton. (Evans.) This is by no means a common insect, although odd specimens are occasionally taken. The pretty white larvæ, spotted with yellow and black, may sometimes be found on Honeysuckle.

ENTOMOLOGICAL RECORD: ORTHOPTERA.

Contributed by Mr. E. M. Walker. (Toronto.)

The marked progress that has been made in the study of North American Orthoptera during the past few years has shown no sign of abatement during the present year, although very little has been done to further our knowledge of the Canadian fauna, nor does the writer know of anyone in the country who is specially interested in this order. It is to be hoped that this state of affairs will soon pass away, since, owing to the tireless energies of Mr. Scudder, it is now a very simple matter to obtain the literature necessary to a student of the order. With Scudder's "Guide to the Classification of N. A. Orthoptera," the "Catalogue of N. A. Orthoptera," and the "Index to N. A. Orthoptera," the student should experience little difficulty in arranging his collection. The Index is by far the most important work on N. A. Orthoptera that has appeared during the present year, and too much can hardly be said in its praise. It is absolutely indispensable to the student, and contains remarkably few errors. One feature of this work, particularly, which is one of immense value, is the full list of localities given under each reference. By this means the student can learn accurately the distribution of any species.

Of other writings on Orthoptera published during the year, some of the more important are the revisions of several of the smaller genera by Scudder ; a few papers by Morse, such as "New N. A. Orthoptera" (Can. Ent., XXXIII., 129) ; "The Xiphidiini of the Pacific Coast," (Can. Ent., XXXIII. 201) ; "Revision of the Orthopteran Genus Trimerotropis," by J. McNeill (published by U. S. Nat. Mus.), are important papers, in which 24 new species are described ; and "Notes and remarks on Mexican Orthoptera, with descriptions of new species," and other papers, by J. A. G. Rehn. The "Insect Book," by Howard, must

not be omitted, as it will be of great benefit to the beginner, and the plates will serve to give a good idea of the general appearance of most of the genera he is likely to meet with.

In regard to Canadian Orthoptera, it may be mentioned that, since the last instalment of the writer's "Notes on some Ontario Acridiidæ" was printed, he has added four more species to the number, and is now engaged in preparing a complete list of the Acridiidæ of Ontario. These four species are the following :—

Tryxalis brevicornis, L. Pt. Pelee, Aug. 8, 1901.

Orphulella pelidna, Burm. Sarnia, Aug. 12 and 14, 1901.

Trimerotropis huroniana, n. sp. Southampton, Aug. 20, 21, 29, 1901.

Paroxya floridana, Thos. Arner, Aug. 9, 1901.

Nothing of any importance has been written on the other families of Orthoptera in Canada, but the writer has for some years been making a collection of the Ontario forms, and will soon have a preliminary list of the Locustidæ ready for publication. Of the last-named family only eight species have been recorded from Ontario, and the lists from the other parts of Canada are no better. The writer, however, has taken twenty-two species in the province, seven of these having been taken for the first time this season. They are the following :—

Scudderia texensis, Pict.-Sauss. Pt. Pelee, Aug. 8 ; Arner, Aug. 9 ; Sarnia, Aug. 12, 14 ; Walpole Island, Aug. 13.

Conocephalus Nebrascensis, Bruner. Sarnia, Aug 12.

Orchelimum nigripes, Scudd. Pt. Pelee. Aug. 7.

" *indianense*, Blatchl. Sarnia, Aug. 14 ; Arner, Aug. 8.

" *longipenne*, Scudd. Pt. Pelee, Aug. 8 ; Walpole Island, Aug. 13.

Xiphidium attenuatum, Scudd. Pt. Pelee, Aug. 8 ; Walpole Island, Aug. 13.

Atlanticus pachymerus, Scudd. Arner, Aug. 9.

Of the Gryllidæ and Blattidæ, the writer's collection contains a number of species as yet unrecorded from Canada. Of these, a few Gryllidæ were taken this year for the first time, *Nemobius palustris*, Blatchl., from Sarnia, Southampton, Owen Sound (Aug.), and Lake Simcoe (Sept.) : and *N. maculatus*, Blatchl. (Tobermory, Aug. 25), being noteworthy. The others have not yet been satisfactorily determined.

Collections of Orthoptera were made at the following localities during the past season :—

Toronto, Lake Simcoe, Leamington, Point Pelee, Arner, Chatham, Sarnia, Walpole Island, (St. Clair River) ; Goderich, Southampton, Tobermory, and other points in the Bruce peninsula and Owen Sound.

In addition to the above, collections of Orthoptera have been made at Aweme, Man., by Mr. Norman Criddle : also in Central Manitoba and in the Okanagan and Nicola valleys, in British Columbia, by Dr. Fletcher.

A DAY AT THE MER BLEUE (EASTMAN'S SPRINGS, ONT.).

By Arthur Gibson, Ottawa.

An excursion to the Mer Bleue at any time from April to November is always of keen interest to Ottawa entomologists. The nature of the locality, and the varied forms of life to be met with there, all tend to entice those who delight in observing and collecting specimens of natural history. The name Mer Bleue is applied to a vast peat bog, which at one point comes close to Eastman's Springs, Ont., and being in a comparatively undisturbed state, as far as the interference of man is concerned, naturally at once suggests itself as a favourite resort for naturalists. Local investigators have always considered this large swamp, and its immediate vicinity, a most lucrative point at which to collect. The members of the Ottawa Field Naturalists' Club have on several occasions journeyed in a body to Eastman's Springs to spend the day collecting, etc., and on all such excursions many interesting plants, insects, etc., have been found.

On the 30th May, 1901, Dr. Fletcher, Mr. W. E. Saunders, of London, Ont., Mr. C. H. Young, of Hurdman's Bridge, and the writer, spent a delightful and successful day at the Mer Bleue. After a 12 mile drive from Mr. Young's residence on the Rideau River, about 10 a.m. we reached the house of our good friend Mr. Manus, who on all such occasions receives us hospitably and kindly allows us to "put up" our horse, etc., for the day. Mr. Manus's house is close to the edge of the swamp, and on the above mentioned date, as soon as we had donned rubber boots, or an old pair of ordinary boots, and ladened ourselves with collecting apparatus, lunch, etc., we immediately headed for the bog. The morning was rather overcast and there was just enough wind to keep down the mosquitoes, which naturally swarm on the bog. This advantage, however, somewhat prevented other and more desirable insects from flying.

Close to the swamp *Pyrausta octomaculata*, with its quick, flighty movements, was readily noticeable and very abundant. After passing through a rather obstructive thick growth of alder, which fringes the margin of the sphagnum carpeted bog, and wading in water sometimes up to our knees for about ten minutes, we reached the swamp proper and at once began collecting. Just at the entrance is a small cleared space of quaking bog covered with cranberries, and with a bubbling gas spring in the middle. Here we stopped a few minutes to drink the water, and to light the bubbles of gas as they rose to the surface. The first specimen found was a nice fresh example of *Hemaris thysbe*, which had just emerged, the wings being still quite soft. *Thecla augustus*, which is always a frequenter of the Mer Bleue, was the first diurnal taken, but it was a little late for perfect specimens. We were hoping to find the larva of this species, but we were too late. This Thecla is fairly abundant every season in this locality, and as nothing is known of the earlier stages of this interesting species, we were anxious, if possible to learn something about it. Several females were followed and watched carefully to see if we could detect them in the act of laying eggs. Dr. Fletcher has reared the closely allied *T. iroides* from caterpillars found feeding on green apples in Vancouver Island, and was of the opinion that the food of the larvæ of *T. augustus* would prove to be the green berries of the Blueberry, or the capsules of some Ericaceous plant, of which there were many kinds growing in profusion on the bog. The females rested for tantalizingly long periods on flower clusters of *Kalmia glauca* and *Ledum latifolium*, both of which were in flower, as well as on the now flowerless bushes of *Cassandra calyculata* which occurred everywhere, but not a single egg could be found.

Over the whole of this immense swamp the aromatic white-flowered Labrador Tea (*Ledum latifolium*), the Leather Leaf (*Cassandra calyculata*), the Sheep-laurel (*Kalmia glauca*), and the delicate Andromeda (*Andromeda polifolia*) were in great profusion. Flying among these, as well as among other plants, were hundreds of specimens of the following geometers, usually to be found in swamps at this season : *Nemaria grataria*, *Fidonia truncataria*, *Eumaturga faxonia*,

Semiothisa granitata, and *Epirranthis obfirmataria*. It was a little late for these species, but nice examples of all were taken.

The most interesting discovery of the day occurred after we had been in the swamp for about an hour, when our attention was drawn to the destruction which had been wrought to the young tamarac and spruce trees (*Larix Americana* and *Picea nigra*). Many of these young trees, particularly towards the top, were denuded of their foliage. After a careful investigation of the branches and remaining leaves, without any insects being found, it occurred to us to examine the moss at the base of the trees. This was not in vain, for as soon as we began to remove the wet moss from the base of the trees, we discovered evidence of the presence of larvæ, by finding some frass, and upon further examination soon located the culprits. These caterpillars were from three to six inches below the surface of the wet moss, and of course were simply hiding during the day, until nightfall, when they would again ascend the trees and begin feeding. Later, however, Dr. Fletcher found a few specimens of the larvæ feeding on the foliage. The trees which were most attacked were small ones, from two to four feet high. About 25 specimens of the larvæ, in all, were collected, but unfortunately only those cared for by Mr. Young produced imagoes. The larvæ collected by Dr. Fletcher and the writer, although feeding well in confinement, and pupating in a healthy condition, failed to give the moths. Some of Mr. Young's specimens were forwarded by Dr. Fletcher to Prof. J. B. Smith, for identification, and the species proves to be a new one to science. In 1899 Mr. Young took one specimen of the moth at the Mer Bleue on the 30th August, and another specimen was taken by him in the same locality last year, early in September. Prof. Smith has named this species *Semiophora Youngii*, in honour of the discoverer. The caterpillar is from about an inch and a quarter to nearly an inch and a half in length, and, for a caterpillar, is a beautiful creature. A description will be given in the Annual Report of the Entomologist and Botanist, to the Dominion Experimental Farms for 1901. The moth is also a beautiful species, varying considerably both in colour and distinctness of markings ; it expands about an inch and a quarter.

As the morning was dull and cloudy, I was in hopes that the sun would come out, at least for a while, during the afternoon, as I was anxious to see *Chionobas jutta* flying, the Mer Bleue being one of the few localities in Canada where this interesting butterfly has been found. My hopes were not disappointed, for soon afterwards the clouds broke and the warm sun appeared in all its glory. It had hardly done so when just ahead of me I noticed a large brown butterfly flying rather quickly. Of course, I immediately gave chase, and in about a minute had netted my first specimen of *Chionobas jutta*, which proved to be a perfect female. Several other specimens were afterwards caught in tolerably good condition. This butterfly, although not very difficult to catch, has the habit of resting on dead branches and trunks of trees, where it is protected considerably by the resemblance of the under side of the wings to the bark, and where it is very difficult to catch.

In the twenty-fifth Annual Report of the Society, Dr. Fletcher published an article on the Pitcher-plant Moth (*Exyra rolandiana*). As neither Mr. Young nor I had ever seen the larva of this pretty little moth, we were anxious to see it at work, and were much interested when Dr. Fletcher, who knew its habits, called us to examine some infested pitcher plants (*Sarracenia purpurea*). We had not looked very long before specimens of the caterpillar were found, their presence being easily detected, as stated in the above article, by the brown dead patch on the leaf, where the caterpillar had fed for a time the year before and which showed plainly on the outside, also by the mouth of the pitcher having been drawn together somewhat, and the remaining space closed up with a web of fine silk. The caterpillar is an attractive one, as the following description, taken from Dr. Fletcher's article, will show : "Length when extended, three quarters of an inch ; spindle-shaped ; distinctly segmented ; general outline closely resembling the larva of *Xanthoptera semicrocea*, figured by Prof. Riley on page 208 of the Canadian Entomologist, Vol. VI, but lacking the fleshy processes of the abdominal segments ; head

and first segments small ; segments 2-7 gradually enlarging to 3 mm., and then tapering to the posterior extremity ; each segment velvety claret colour, the velvety pile only in the central part of the segments ; the intra-segmental sutures smooth, pale, in some specimens almost white: head white, marked symmetrically on each side with three black marks, the uppermost almost round, the middle one crescent-shaped, and the lowest above the ocelli, comma-shaped ; spiracles brown, ringed with black ; on each segment about six small black tubercles bearing slender tawny bristles ; thoracic feet and prolegs darkened externally." The pitcher plant is very abundant at the Mer Bleue, and we soon found a number of the larvæ. These were in different stages of development, from about three-eighths of an inch to full grown larvæ. One pupa was also found in one of the plants. The moth " is a small, thick-set insect, about three-eighths of an inch in length, of a dark, metallic, purplish hue, which on the forewings is relieved by a yellowish discal patch. The base of the wings is deep red. The dark colour on the wings of the female is much blacker than in the other sex. The hind wings in both sexes are black. When at rest, the wings are sloped like those of a Plusia."

Lithacodia bellicula, a pretty little noctuid, was fairly common, and some nice fresh specimens were secured. Two other interesting noctuids were captured, viz. that beautiful, and extremely difficult to catch, little species, *Anarta cordigera*, which had been taken here before, and which we were specially on the look-out for, and *Mamestra rugosa* ; one specimen of the former was collected by Mr. Young, and one of the latter by the writer, this being the first record of the occurrence of *M. rugosa* in the Ottawa district.

Argynnis triclaris always an interesting butterfly is also a frequenter of the Mer Bleue, but on account of its rarity few specimens are found. We were in hopes of meeting with this insect, and, although we watched for it throughout the day, no specimen was captured. A few Argynnids were noticed flying, and specimens of *bellona* and *myrina* were caught. Whether any of those observed were *triclaris*, we could, of course, not be sure. The species flies about a fortnight later, Dr. Fletcher having taken specimens at the Mer Bleue on the 11th June one year and on the 16th June another year.

Doubtless, if the weather had been more favourable, other interesting lepidopterous insects would have been observed. Specimens of coleoptera, hymenoptera and diptera were collected and some rather rare species secured. These insects would, of course, have been more plentiful, had the day been brighter.

While Dr. Fletcher, Mr. Young and the writer were occupied the greater part of the day in hunting for insects, or in collecting plants, Mr. Saunders who is an ardent ornithologist, armed with his field glass, was busily engaged the whole time " looking up " birds and studying their ways. Some nice nests, with eggs, of the Palm Warbler, the Nashville Warbler, the Swamp Sparrow, and the White-throated Sparrow, were secured, and many useful notes were made upon the habits of the birds mentioned.

We reluctantly turned our steps homewards as evening came on, well loaded down with specimens of plants and insects, and with some clutches of rare eggs, determined if possible to return again next year, a little earlier in the season, so as to tackle the problem of the food plant of *Thecla augustus*, and later to learn something of the life-history of *Chrysophanus epixanthe*, which swarms on the Mer Bleue about the 1st July.

COMMERCIAL ENTOMOLOGY, OR INSECTS AND INSECT-PRODUCTS MET WITH IN COMMERCE.

By Charles Stevenson, Montreal.

Everyone is familiar with the valuable place that the silkworm holds in commerce But it would surprise many persons if told how many of those creatures familiarly known as "bugs" command a price in the market, and very incredulous some would be, if informed that the only too common "bed-bug," *Acanthia lectularia*, Linn., or "B-flat," as it was called by a musical wag, is used as a drug. A certain school of practitioners prescribe this pest in the form of a tincture, as well as another "bug-bear" of the cleanly housewife—the cockroach, the species *Periplaneta Americana*, Linn., being specified for the purpose. Not long ago, *Periplaneta orientalis*, Linn., the "oriental roach" or "black beetle," a native of Asia, which is now found in most parts of the civilized world, was recommended for the same use as the "blister beetle" or "Spanish fly," *Cantharis vesicatoria*, Linn,, which is an official drug in both the allopathic and homœopathic pharmacopœias. The Spanish blister beetle is indigenous to southern and central Europe, living on the ash, lilac and elder trees. It is of a brassy green colour, and is collected in Spain, Italy, Hungary and Southern Russia, but that which comes from the latter country is most esteemed and is larger and of a copper colour. Several American species are found to possess efficient vesicating properties; among them may be mentioned the "potato-fly." *Epicauta vittata*, Fab., which has the thorax black and the wing cases with yellow stripes; *E. cinerea*, Fab., a black species, *E. marginata*, Oliv., another black species, with ash-colored margins on the elytra; *E. atrata*, Fab., uniformly black, and smaller than those previously mentioned. There is a species very abundant in Kansas and Colorado, *C. Nuttali*, Say, which closely resembles the true Spanish blister-beetle, and has also attracted attention in pharmaceutical commerce.

Two vesicating insects, *Mylabris cichorii*, Fab., and *M. phalerata*, Pallas, indigenous to East and South Asia, and also to some districts of Africa, are now imported as "Chinese blistering flies, and are found to be quite as efficient as the official insect. *Lytta gigas*, Fab., of the East Indies, is also sometimes met with in commerce.

The "oil-beetle," *Meloe majalis*, is prescribed in homœopathy as a tincture, to make which the living insect is drowned in alcohol.

If allopathic medicine were to give way to the doctrine of "*similia similibus curantur*," farmers might be able to form a "combine" for the supply of the "Colorado potato-beetle," *Doryphora decemlineata*, Say, that insect being the base of a certain tincture, made by taking the living insects, one part, crushing them, adding five parts of alcohol, macerating for eight days in a dark, cool place, shaking twice a day, and then pouring off the liquid, straining and filtering. In the same way medicines are made of several spiders, and a trituration is prepared of the freshly-spun webs of the genus *Aranea*.

Although entomologists have often raised spiders for purposes of scientific observation and investigation, spider-raising as a money-making industry is somewhat novel. One has only to go four miles from Philadelphia on the Lancaster pike, to the farm of Pierre Grantaire, and see what can be found nowhere else in the United States, and abroad, only in a little French village in the department of the Loire. Pierre Grantaire furnishes spiders at so much per hundred for distribution in the wine vaults of merchants and the *noveaux riches*.

In some forms of practice several "live" insects that possess poisons are used in making tinctures; they are irritated or aggravated so as to make them "throw off" by shaking or stirring them up in a jar or bottle. One of these creatures that is "first made mad" before the introduction to alcohol is the "hornet" *Vespa crabo*, Linn.; another is the well-known "honey bee," *Apis mellifica*, Linn. Besides the tincture of the whole insect, the pharmacist prescribes

the virus, to be obtained in the following way: "Draw out the sting, together with the poison bag, from a bee freshly killed. Take hold of the bag, insert the point of the sting into a small glass tube and squeeze the poison into it, or take a small bee with a pair of pincers and allow it to seize a small lump of sugar, which will absorb the poison." This hymenopterous fly is an important factor of the produce market, being the manufacturer of a wax much used for many purposes, and that sweet article of household use, as also in dispensing drugs—honey.

Other victims of the pharmacist are the bright-red minute Acarus *Trombidium musca domestica*, which the pharmacopœia states is "found under the wings of the common fly in Philadelphia." The aphis or plant louse of *Chenopodium glaucum*, and the red ant, *Formica rufa*, Linn. Nor does the gardener's friend, the "Lady-bird beetle," escape, for the "live insects" are "pounded to pulp" and triturated with sugar of milk.

It is recorded that the Greek barber surgeons of Asia Minor valued ants for holding together the edges of a cut. They held a large *Camponotus* in a forceps and when it opened its mandible, wide, it was permitted to seize the edges of the cut, which were held together for the purposes its head being cut off as soon as a firm grip was made. A similar practice was observed in Brazil several years ago by M. Morqueys of Rouen, and is cited by Sir John Lubbock but is not mentioned by either Bates or Wallace.

The bushmen of the South African district Kalahai set a high value on the leaf-beetle *Diamphidia*, as they use its juice and its larva for poisoning their arrow-heads.

For the Arts and Technical Sciences, there are several insects that are of great value. We have to thank a small Mexican scale-insect *Coccus cacti*, Linn. for the brilliant colour called cochineal which has superseded even the splendid and regal "Tyrian purple" of ancient days. It is used in the manufacture of dyes, paints and in pharmacy and also for coloring confectionery. It is of no value in medicine although it has been used as an "anodyne, tonic, astringent" Another important hemipterous insect is the West Indian *Coccus lacca*, Kerr. the female of which punctures the young branches of several tropical trees, thereby producing a resinous product called, lac, stick-lac, or shellac, used in the manufacture of varnishes, sealing-wax and a dye called Lac-lake. Indian cochineal is prepared from stick-lac and imported from India for coloring woollen and silk-goods. Its colour is similar to, but less brilliant than cochineal. *Coccus ilicis*, Fab. supplied the famous dye KOKKOS of the Greeks, Coccus of the Romans, Kermes of the Arabs, Cocchi of the Italians and Al-kermes of the Persians Though a larger species than *C. cacti* its colour is inferior and less in quantity. Chinese-wax is the produce of a similar insect *Ericerus pela*.

In Syria a peculiar secretion called Manna is produced by the punctures of the female *Coccus manniparus*, Fab. on the young shoots of the *Tamarix mannifera*, Ehrenberg. It is a kind of reddish syrup containing glucose, dextrin, and cane-sugar, and is eaten by the Arabs and the monks of Mount Sinai like honey with their bread. There is another product which goes by the same name in the drug trade, but it is not the same, it consists principally of a sugar called mannite. There are several other saccharine products of insects which have been classed with Manna, but they are not entirely soluble in water. The term manna is more interesting historically than the article now known by that name. It was originally applied to the food so miraculously supplied to the Israelites during their wanderings in the wilderness. What that substance was we do not know. The natives around Mount Sinai believe that the substance collected by them is what the children of Israel fed on.

That rapacious insect, the migratory locust *Œdipoda migratoria*, Linn. is valued as an article of food in Arabia and Egypt. They appear in the markets preserved in brine or sun-dried and are even exported as an article of commerce. Some authorities claim that it is the insect which St. Matthew (III. 4) refers to when he says "John's meat was locusts and wild honey" and in Leviticus (XI. 22) we find that locusts constituted a common food among the Jews.

In Tokio, Japan, twelve varieties of katy-dids or bell-insects, are sold, nine of which are bred in captivity. The purchasers keep them in cages for the sake of their musical sounds, as we do song birds.

The essential constituents of ordinary writing ink are galls mixed with iron sulphate and gum. These galls are produced by a small hymenopterous insect *Cynips galla-tinctoria*, Oliver, on the *Quercus infectoria*, Oliver, of the Levant. That instrument said to be mightier than the sword is dependent on a very small creature for its power. There are many other galls but they are not much in demand.

It is well known that what is perhaps the richest and most elegant apparel which adorns the human race is the product of a caterpillar,—the silk-worm,—*Bombyx mori*, Linn. Much attention has been given of late to other silk producing larvæ, many of whose products are being found of service, especially :—*Philosamia cynthia*, Drury, the Ailanthus moth. *Antheræa mylitta*, Drury, the Tussah moth. *A. yamamai*, Guer. of Japan and several similar moths.

During recent years the exporting and importing of insects by Economic Entomologists has been resorted to, for the purpose of preying on other insects that may be destroying food-plants.

In closing this short review of the role of insects in the commercial world, attention might be called to the fact, that there are many persons who make more than a livelihood by collecting and selling Entomological specimens to collectors and curiosity hunters, the experiences and anecdotes of whom are often very entertaining.

THE FOOD OF THE GRASS SNAKE.

By J. B. Williams, F.Z.S., Toronto.

There was an article in the Annual Report for 1896 on Insectivorous Mammals,* and the relationship which they sustain, on account of their food habits, to Economic Entomology.

I find that the food habits of one of our Reptiles,—the little Grass Snake (*Liopeltis vernalis*, —are of considerable economic interest.

I have often tried to keep these snakes alive, but never, until recently, have been able to find any food that they appeared to relish ; but while looking under a plank one summer for earthworms and slugs with which to feed some Dekay's Brown Snakes that were in the same glass case with the green ones, I found several of the Noctuid caterpillars that go by the name of "cutworms," and put them in the reptile case with the earth-worms. They had not been in for a minute before the Grass Snakes seized and eagerly devoured them, though they had rejected all other food that had been previously put into the cage. They continued to take them readily until the supply of "cutworms" was exhausted, and then, as I could find nothing else that they would eat, I let them go.

People generally try to kill grass snakes if they find them about their lawns, but it is evident that they should be protected and their enemies killed. No bird could have reached these caterpillars in the position where I found them under the plank, but it was just the kind of place into which a snake could creep and obtain its food. They probably eat other smooth caterpillars, and where numerous would be a check on the dreaded "army worm," for from the eager way they devoured the cutworms, Noctuid larvæ evidently constitute one of their favorite foods.

The Grass Snake is a beautiful little creature and perfectly harmless. Its food habits show that it is very beneficial, and it should be protected in every way and not destroyed or wantonly put to death.

. Ont., 1896, 16-21.

THE NORTH-WEST (CANADA) ENTOMOLOGICAL SOCIETY.

Annual Meeting.

The third annual meeting of the North-West (Canada) Entomological Society was held at Lacombe, Alberta, on November 9th, 1901. The chair was taken by the Vice-President, the Rev. M. White. Many letters were received in support of the meeting, among them being a letter from Dr. James Fletcher, Dominion Entomologist, of kindly advice to the young people of the newly-formed Lacombe Field Club, and a letter from Mr. C. W. Peterson, Deputy-Commissioner of Agriculture, N.W.T. Mr. Peterson expressed particular satisfaction at the number of agricultural societies throughout the North-West Territories which had decided to encourage the Entomological Society by affiliating with it. This, he said, is a step in the right direction, and that if agricultural societies would more generally support such institutions they would more nearly fulfil the objects contemplated in the law under which they were organized. An earlier letter from Mr. Peterson was also read advocating the enlistment of the sympathy of the school teachers and trustees throughout the Territories in support of the movement.

Among those present at the meeting were two of the teachers of the Lacombe school and a number of the pupils of the school.

The Chairman, after some opening remarks, called upon the President, Percy B. Gregson, for his address, which we give as follows :

President's Address.

"Ladies and Gentlemen,—We have now completed the third year of our existence as a society, and it has become the custom to review the progress we have made during the preceding year, and to consider what good we have done. By thus taking stock, as it were, of our conduct, we gain some light on the course we should pursue in the forthcoming year. In this vast new country a society of any sort to become popular has to enlist the sympathy and interest of the settler, and to do that it must show that its labors are identical with the farmer's welfare. When this is clearly understood the Society becomes a popular institution ; and this is one of the reasons why we have annual meetings. The chief work of the Society is to study and encourage throughout the land an interest in insects and plants and their habits, and a knowledge of the remedies used against such as are injurious. The time has passed when such a study was looked upon as an evidence of lunacy, and I believe we shall see, within the next few years, the introduction into every school in the country of a system of nature study. The young people must be encouraged to take an active interest in the subject. The study of insects is emphatically one which develops the powers of observation.

Some idea of the practical value of this subject to the farmer may be formed from the fact that the damage done by insects last year to the farming and gardening industries in North America amounted to many millions of dollars, and a glance presently at the list of injurious insects for 1901 will show that the Territories are sharers in this great loss. Farmers as a rule are wide-awake enough to anything which threatens their pocket, though it is strange how indifferent many of them seem when their crops are threatened by insects or weeds. They will allow, for instance, the wholesale destruction of turnips and cabbages by insects, when a few cents worth of hellebore and kainit, or Paris Green would have saved much of the crop. And farmers are just as culpable in the matter of weeds.

The question therefore arises,—"How does the Society propose to assist the Farmer?" and in answering this let us first see what we have already done.

In the Society there are two branches of study,—Entomology and Botany. Under Entomology is included insects (noxious, beneficial, harmless, etc.,) and under Botany is included the study of their food, and the study of weeds and other wild plants. Firstly, then, addresses

on insects or weeds have been given whenever requested at Farmers' meetings. About seven of these, besides some written addresses, have been given during the year at different places.

Secondly, the Society has distributed to every affiliated agricultural society (except to those but recently affiliated) a collection of ripe weed seeds, in little labelled bottles, of nearly every species of noxious weed within the Territories. This will enable any farmer, by applying to the Secretary of his Agricultural Society, to see what sort of weeds he has in his seed grain.

Thirdly, the Dominion Entomologist, Dr. Fletcher, has offered two prizes (standard works on Entomology) to the young folk of Lacombe district for (1) the largest collection of insects and (2) the best collection of noxious and beneficial insects, and the Society has supplemented these prizes by a cash prize of a dollar for the best collection of wild plants (including noxious weeds). There have been several young competitors. Prize No. 1 was won by Master Benj. H. Howell of Lacombe; prize No. 2 by Master D. E. Tipping of Waghorn, and that for wild plants and weeds, by Miss Lucy McL. Howell of Lacombe (all members of the Lacombe Field Club).

Fourthly, a Field Club has been formed of some of the young folk of Lacombe under the Society's auspices, and by the example these young people set, many of the prejudices against insects will, it is hoped, be dispelled. For instance, with what horror the dragon fly is often regarded. We hear them called "Devil's darning needles," and that they will sew up little boys' eyes and ears: and we hear of caterpillars and beetles that they will bite us; and many other similar prejudices exist. These prejudices really are harmful, because they lead our young folk into error, and on account of these prejudices many insects are cruelly destroyed which should be preserved, and on account, too, of them our young folk conceive a distaste for studying their habits.

Fifthly, the Society has distributed to non-subscribers some hundreds of copies of those two excellent agricultural papers, The Nor'west Farmer and The Farmers' Advocate. These papers, or one of them, should be taken by every farmer in the country. In addition to this, the Secretary of the Society has written (as replies) many scores of letters of advice on special noxious insects to farmers individually, with the remedies.

Within the last year several agricultural societies have affiliated with, *i. e.*, have become supporting and subscribing members of the Entomological Society. The names of these affiliated Societies are the Westaskiwin, Lacombe, Red Deer, Innisfail, Olds, Calgary (Inter-Western Pacific), Regina, Moosejaw and Central Saskatchewan. These in return for their financial support and influence have the right to claim addresses from the Entomological Society at their Institute or other meetings. The funds of the Society ($1 membership or affiliation) are supplemented by an annual grant from the Territorial government, and are devoted solely to extending the Society's work. This, then, is some outline of what the Society has already done.

Let us now turn to the next part of our programme:—"How shall we proceed in the future?" I think that the course I have just outlined should be further pursued. Every feature of it, and particularly that of encouraging the younger people, can I believe be extended with benefit to the country. Written or verbal addresses will be given willingly, whenever desired by affiliated agricultural societies. Further prizes will be offered for competition, and these competitions will next year be thrown open to the young folk throughout the Territories.

With regard to the schools, I may say that the teachers (3) in the Lacombe School are actively interested in the work of the Society, and the trustees of that school give every encouragement, and we hope to extend this interest to teachers in certain other schools next year;

and personally I should like every one (teachers and their pupils, farmers and their young folk are especially welcome) to come at any time to my residence, and inspect, under my supervision, the collections of the Society. There, besides many beautiful insects, they will see represented very many of the noxious and beneficial insects from all parts of the States and Canada, and learn the remedies.

More agricultural societies will also be invited next year to support the Entomological Society. This, as Mr. Peterson observes in his letter, is also a step in the right direction, and in accord with the spirit of the law under which the agricultural societies are formed, and with the sentiment of the Department. The distribution of collections of weed seeds will be extended, and a collection of named pressed noxious weeds themselves will gradually be prepared for each affiliated agricultural society. I am endeavoring to form collections of named noxious and beneficial insects for distribution in the same way. I want every insect—no matter how many—sent to me for that purpose every year. The Society will provide the cases and pay all necessary postages. It would be my wish to start a museum of weeds and insects in every school and agricultural society in the Territories if they would only show an active interest in the matter. I have prepared the first of such collections of weeds; this, if the Lacombe Agricultural Society will accept it, will go there and be kept near the collection of seeds, for public reference. A case of insects will also shortly be ready for it, and it will not be my fault if there is not also next year the founding of similar collections at the Lacombe school. Turning our attention now to the insects of 1901, I wish first to thank Mr. T. N. Willings, the Territorial Weed Inspector, and the many other gentlemen who have sent me very valuable accounts of insects noticed by them.

Noticeable Insects of 1901 in Alberta.

Undoubtedly the most conspicuous feature of the year throughout the whole of Central and Northern Alberta from Olds to Edmonton, and east into parts of Saskatchewan, has been the myriads of dragon flies. In the early part of the year we were threatened with an unusual plague of mosquitoes. The flooded sloughs teemed with their larvæ, but very soon after the appearance of the perfect mosquito the dragon flies came on the scene, and during July and August immense numbers filled the country, and in many parts they literally exterminated the mosquito on the wing. Nothing but good has ever been recorded of the dragon fly,—Fig. 57) in fact their mouths are not adapted for eating vegetation, and their larvæ and pupæ live wholly in water, and in both stages are active, their food being larvæ of mosquitos and other soft-bodied aquatic insects

Of a different nature, another remarkable occurrence of the season throughout the entire North-West from far south of Calgary, and reported by Mr. T. N. Willing, Mr. F. H. Wolley-Dod, Mr. Clare, of Edmonton, and residents in Prince Albert, Grenfell, Beulah (Man.), and elsewhere, has been the very large numbers of caterpillars of the Painted Lady butterfly (*Pyrameis cardui*). The favorite food of these caterpillars is Thistle (including — let us be thankful—the Canadian Thistle), Blue Bur and Pasture Sage. Mr. A. J. Dennis, of Beulah, says that, during four consecutive days in the first week of May, there was a continuous flight of these butterflies in a south-easterly direction, with wind blowing from the south.

Fig 57.—A Dragon-fly.

Warbles this spring were decidedly more abundant than last year. The deaths of a good many cattle in the early part of the year were, I believe, accelerated, if not directly caused by this pest. On one carcase I counted 175 distinct warbles.

The Horse bot-fly has also been very troublesome.—(Fig. 58.) I might suggest here a simple remedy for this, which was published some time ago by the United States Department of Agriculture, and appeared in one of our agricultural papers. Bruise some Tansy and make an infusion of the juice,—in other words, tansy-tea. Give the horse some of this tea in the morning, and a dose of salts in the evening, and it is said a complete cure will be effected. The process seems like this,—the tea operating to kill the bots clinging to the membrane of the horse's stomach, and the salts expelling the dead bots.

Fig. 58.—Horse Bot-fly. Female.

The Diamond-back moth (*Plutella cruciferarum*) has been again very abundant in all parts of the Territories, seriously damaging many turnip and cabbage crops The field of riddled and bleached plants was a common spectacle. From the presence last year of parasites in considerable numbers, there were hopes that this pest would not be troublesome this year, but every turnip and cabbage field neglected becomes a simple breeding ground for this insect.

Some cabbage crops about 12 miles east of Lacombe also suffered from the Red turnip-beetle (*Entomoscelis adonidis*). Its appearance is also reported from a few widely separated points in the Territories, but in certain places where it was abundant last year it seems temporarily, at least, to have disappeared.

The Colorado potato-beetle (*Doryphora decemlineata*) is gaining headway. They are reported from Calgary, MacLeod, Pincher Creek, Walsh, Moosejaw and other points. The winters are not fatal to this pest, which passes that season composedly in the pupa state.

Another pest of the potato field more troublesome this year than usual is a wireworm,—chiefly (so far as I have observed) the larva of a "Daddy Long-legs" or Crane fly (*Tipula*). It was a common thing (on taking an average sample) to find 15 per cent. of the potatoes affected by this grub. Reports of its prevalence come from all parts of the Territories.

Damage by root maggots of various kinds has also been conspicuous this year. It is reported from many points, and more particularly from Edmonton and St. Louis (Sask.). Cauliflowers, cabbages and turnips were all about equally the sufferers. Mr. Willing reports the larvæ of a "Cabbage" butterfly (*Pieris protodice*) as having been rather abundant in gardens around Regina, and here and there the little active flea-beetle (*Haltica striolata*) has been destructive to young turnips.

Of foliage trees, Mr. Willing mentions Tent-caterpillars of both species (*Clisiocampa Americana* and *C. disstria*) as having been abundant in Assiniboia, and, for the first time recorded, considerable numbers of the latter species appeared in the Red Deer and Lacombe districts (on aspen poplar). I found a large percentage of these were parasitised by Tachina flies, and I hardly think trouble will be given by this pest for awhile. Aspen poplar also suffered in early spring throughout the entire North-West from the Pallid aspen beetle (*Gonioctena pallida*); and the disagreeable larvæ of the Striped Cottonwood beetle (*Lina scripta*), the pest of osier growers, again attacked willows on river banks, and in Regina box elders suffered from the Box-Elder bug.

Of fruit trees, the black currant in gardens around Regina is reported to have suffered from the "Currant worm."

Cutworms, which must not be confounded with wireworms, from which they are in every way distinct, have not this year given so much trouble. The heavy rains were unfavorable for their development as a pest.

With regard to grain, there have been several complaints of injury to oats when in first blade, the blade wilting away and dying. In two cases which I went to see, the damage was the work of a wireworm of the same genus (*Tipula*) as that affecting potatoes, though a different

species. Mr. Willing mentions some talk by farmers of wheat being slightly damaged by an insect, but a report of a more serious nature comes from St. Louis (Sask.), where rye suffered from a stem-midge maggot, which fed within the stem about 1 to 2 feet above ground, and deadened the straw before the heads filled. Several farms, it was stated, bore evidence of the presence of this pest in the rye fields, the heads and straw turning white and dead six weeks before harvest.

A few more words and I will close the list. I made some mention last year of the liability of the arrival of new pests, to which we, in a new country, were always subject. It would seem there are this year two absolutely fresh pests to be reported, both of them beetles. One (*Trirhabda attennata*) I have found in considerable numbers on raspberry canes (eating the canes bare of leaves), and the other (*Dichelonycha testacea*) on French beans and other garden stuff.

With regard to remedies, as I have taken up so much space already, I will, if the papers will lend me a column, publish in detail, before the winter closes, those which are recommended for each pest.

After the close of the discussion consequent on the address Mr. Howson P. Foulger, of Urquhart, near Lacombe, and Dr. A. E. Jamieson, of Lacombe, were elected members of the Society, and the officers of the Society for 1902 were elected. The officers for 1901 were re-elected, with the exception of Mr. W. Wenman (one of the Council), who has left the country, Mr. Foulger accepting office in his place.

Miss Lucy McL. Howell was then called up and received her prize from the chairman, and the books for prizes Nos. 1 and 2 (Dr. Fletcher's) were selected.

Acknowledgments of several gifts of insects to the Society's collections were then recorded, and the Report of the Council and the Auditor's Report read and the interesting proceedings terminated.

Report of the Council.

On behalf of the Council of the North-West (Canada) Entomological Society the President begs respectfully to submit the following report :--

There has been a somewhat drastic remodelling of the Members' Roll. For some two years the Roll has been encumbered with the names of gentlemen who, in the inception of the Society, became admitted as members, but who notwithstanding their membership have done nothing to help it forward. In our articles of constitution there is a clause providing for the automatic removal of such apathetic gentlemen from the Roll in the event of no interest in the Society being evinced by them for a period of eighteen months from enrolment. They cease to be members. These gentlemen occasion needless expense to the Society, and the result of the operation of the above mentioned provision has been that thirty names have been expunged from the Roll. The members helping the Society by cash or kind number thirty-seven. Space will not allow publication of their names, but the President, as the person perhaps most deeply interested in the success of the Society, takes this opportunity to thank each of them, as it were, in person. It would be invidious to single out any individual, as necessarily some have more facilities than others ; but all, as the President gratefully believes, support the Society from the purest and most disinterested motives. An institution of this kind is not a commercial concern paying dividends, though as an element of civilization such an institution does, it is conceived, benefit the community as a whole. This, however, the President can safely say, that had it not been for the guidance of his steps by Dr. James Fletcher, Dr. L. O. Howard, Mr. C. W. Peterson, Prof. C. C. James, Mr. H. H. Lyman, and the Rev. Dr. Bethune, and encouragement of other gentlemen, his pathway would have been strewn with boulders.

Additional substantial gifts of Lepidoptera by Messrs. N. B. Sanson, E. F. Heath, and William Wenman, and of Coleoptera by the Rev. Dr. Bethune and Messrs. A. W. Hanham and

Alex. Kwiat (and among the Coleoptera being a series of Parnidæ from Mr. W. D. Richardson), and most generous exchanges by Dr. Strecker, Messrs. W. N. Tallant, Frederick Knab, the Hon. P. C. Truman, and other gentlemen, and a gift by Dr. Fletcher of a series of mosquitoes, have materially augmented the Society's Collections. These gifts are extremely acceptable.

The interest of farmers in the objects of the Society is steadily increasing,—this is evidenced by the affiliation during the past year of additional agricultural societies with our own.

Dr. James Fletcher in the early summer generously offered two prizes for competition by the young folk of Lacombe for the best general collection of insects, and the best of noxious and beneficial insects, the Society adding a third prize for pressed wild plants (including weeds). The Lacombe Field Club furnished the prize winners among several competitors. Rains during the summer interfered somewhat with regular outings of the Club.

PERCY B. GREGSON, President.

November 7th, 1901.

AUDITOR'S REPORT.

Receipts and expenditure of the North-West (Canada) Entomological Society for 1901 :—

RECEIPTS.	$ c.	EXPENDITURE.	$ c.
Members' fees	25 00	Meetings (fa mers, etc.)	14 85
Territorial Government Grant	25 00	Printing account	3 00
Deficit (met by President)	10 00	Subscriptions to agricultural, etc., papers	8 50
		Stationery	8 00
		Cork, pins, etc.	5 40
		Apparatus	5 00
		Expense account (postages, freights, etc.)	10 25
		Sundries (including prize, and distribution of agricultural journals)	5 00
	$60 00		$60 00

I have examined the books and vouchers of the Treasurer of the North-West (Canada) Entomological Society, and find them correct, and the above is a true statement of its receipts and expenditure for 1901.

(Signed) J. L. TIPPING,
Auditor.

November 8th, 1901.

OBITUARY.

MISS ELEANOR A. ORMEROD, LL.D.

The Science of Entomology in its practical application to agriculture has suffered a great loss through the death of Miss Ormerod, which took place at her residence, Torrington House, St. Albans, England, on Friday, July 19th, 1901. Economic entomologists, not only in England but throughout the world, have been moved with profound regret that a career so remarkable and so useful should have been brought to a close, but one could hardly hope that the aged lady would long be able to sustain the burden of increasing infirmities and the trials of a painful and protracted illness.

Miss Ormerod was born at Sedbury Park, Gloucestershire, on May 11th, 1828, and had thus entered upon her 74th year. She was the youngest of a family of ten, consisting of seven sons and three daughters, of whom she was the last survivor. Her father, Mr. George Ormerod, LL.D., F.R.S., F.S.A., etc., was a distinguished literary man and the author of a notable "History of Cheshire;" her mother was a daughter of Dr. John Latham, F.R.S., at one time President of the Royal College of Physicians. On both sides, therefore, she inherited literary

and scientific tastes, and at an early age displayed a love for natural history and out-door pursuits.

One of Miss Ormerod's earliest recollections (as related by Dr. Fream in the "Journal of the Royal Agricultural Society") was being placed in a chair to watch some large water-grubs in a glass, when, to her amazement, one of the creatures which had been injured was devoured by its companions. This youthful observation inspired her with a taste for natural history investigations, and with them she combined a deep interest in botany, horticulture and agricultural chemistry; she also applied herself to the study of Latin, German, French, Italian, Spanish, and other languages. While devoted from her earliest years to objects of out-door life, she was constantly confined to the house by repeated illnesses, but this enforced seclusion only served to render her a more minute, painstaking and exhaustive observer. As her father became advanced in years, it devolved upon her to take a large share in the management of his estates, which included a home farm, and in this way, no doubt, she was led to give the practical turn to her entomological investigations which caused them to be of so much public value afterwards. She also when quite young took an interest, that she continued to maintain throughout her life, in meteorological observations, and in course of time published "The Cobham Journals" of meteorological and phenological records made by Miss Molesworth at Cobham in Surrey. She was the first lady o be admitted as a Fellow of the Royal Meteorological Society, as she was also the first lady to receive (in 1900) the honorary degree of Doctor of Laws at the University of Edinburgh. On the latter occasion Sir Ludovic Grant, the secretary to the Senatus, in presenting Miss Ormerod to the Vice-Chancellor, spoke as follows :—

"Our roll of honorary graduates in law contains the names of many illustrious men, but you will search in vain for the name of a woman. To-day, however, a new roll is to be opened—a roll of illustrious women, and it is matter for congratulation that this roll should begin with a name so honored as that of Miss Ormerod. The pre-eminent position which Miss Ormerod holds in the world of science is the reward of patient study and unwearying observation. Her investigations have been chiefly directed towards the discovery of methods for the prevention of the ravages of those insects which are injurious to orchard, field, and forest. Her labours have been crowned with such success that she is entitled to be hailed as the protectress of agriculture and the fruits of the earth—a beneficent Demeter of the Nineteenth Century. It would take long to enumerate her contributions to entomological and phenological literature, but I may select for mention the valuable series of reports, extending over twenty years, the preparation of which involves correspondence with all parts of the world. Remarkable, too, is the list of the honors which she has received. She was the first lady to be admitted a Fellow of the Royal Meteorological Society, and she has been awarded the silver medal of the Société Nationale d'Acclimatation of France. To these distinctions the University of Edinburgh, sensible of her conspicuous services, and not unmindful of her generous benefactions, now adds its Doctorate in Laws.'

A beautiful collection of injurious insects, and an accompaying series of diagrams, the work of Miss Georgiana Ormerod (her elder sister), now the property of the university and in the custody of the Industrial Museum, Edinburgh, were the much appreciated gift of Miss Eleanor Ormerod. An excellent oil painting of herself, also the gift of the generous donor, has been hung in the university court-room, where it occupies a suitable position in the inner circle of those whom the university has delighted to honour.

At Sedbury, where she continued to live until the death of her father in 1873, the farmers and farm labourers keenly appreciated the value of Miss Ormerod's studies when they understood what good results might follow from them, and they not only gave her the benefit of their own observations in the field, but rendered willing aid in tracing noxious insects and collecting examples of the mischief they were doing. By 1868 her attainments in the science of economic Entomology were so well recognized that she was invited to contribute to a collection then begun by the Royal Horticultural Society and the Science and Art Department of South Kensington,

to illustrate insects useful or prejudical to agriculture. She had previously invented a process of her own for the execution of plaster models, colored by her own hand, of rare garden plants and hot house flowers, and also a method of making electrotype casts of leaves and reptiles, which were remarkably beautiful and artistic. For ten years she was a constant contributor to these collections not only of insects, but also of interesting specimens of grain, roots, timber, etc., exhibiting the nature of the injury done. As an acknowledgement of the value of the assistance she thus afforded, the Royal Horticultural Society presented her with its "Silver Floral Medal."

In 1872 she contributed to the International Polytechnic Exhibition at Moscow a collection of models of insect injuries to plants and electrotypes representing British Natural History. On this occasion also her work was so highly appreciated that she was presented by the University of Moscow with its Silver Medal, its great Silver Medal, and also its Gold Medal of Honour. At a later date she was awarded the Silver Medal of the Société Nationale d' Acclimitation of France in recognition of her services in economic etomology.

In 1877 Miss Ormerod, then in her forty-ninth year, began, with the assistance of her sister, Georgiana, her especial work which caused her to become known throughout the world as the foremost authority in England on practical entomology. She then undertook the preparation of an annual "Report of observations of Injurious Insects and Common Farm Pests" and continued for twenty-four years to issue a volume at her own expense. When she commenced her arduous labours in this connection, very little was known by farmers and gardeners, and not much more by entomologists in Great Britain, of the habits and life histories of insects injurious to farm, garden and orchard crops and to live stock, or of the best means of destroying them or preventing their ravages. What Miss Ormerod did was to collect the observations of a large number of persons in the British Isles, made under her instructions for the most part, to obtain details of any experiments carried out for the destruction of insect pests or the prevention of their attacks, to correspond with workers in other parts of the world who were engaged in similar investigations, to systematise, arrange and publish the information thus obtained, with the addition of her own knowledge and observations of the subject. She also undertook to identify for enquirers any specimens of insects found preying upon their crops and to give prompt advice as to the most likely remedies to adopt. Her correspondence after a few years became immense and the work arduous in the extreme; but she was a woman of boundless energy, full of inspiring enthusiasm, whom nothing could daunt and who shrank from no difficulties or trouble. Her sister Georgiana, her constant companion during these years till her death in 1896, possessed a large measure of artistic talent and was invaluable through her ability in drawing illustrations of insects and their works. She published some years ago a large series of excellent coloured diagrams of injurious insects, which the writer, as well as others, has found most useful for the illustration of lectures on subjects of this kind. Her loss was an irreparable one to her life-long companion and co-worker.

Something of the nature of Miss Ormerod's work, how she appreciated her correspondents, and the modest estimate at which she appraised her own great services to her country, are well stated in her simple and natural way in the preface to her last, the twenty-fourth, Annual Report. When she began the great work of her life in 1877, to quote her own words, "Comparatively little was known of the habits and means of prevention of insects seriously injurious to our crops, and of this little a very small amount was accessible for public service, and I undertook the series of Reports in the hope (so far as in my power lay) of doing something to meet both these difficulties." How fully her hope was realized is shewn by her further statement, "Now the *necessities* of the case have been gradually changing. Year after year information has been sent, gradually completing *most* of the histories of *most* of our worst insect pests, and now additional information is rarely on points of great agricultural importance." In other words she has succeeded, by dint of long continued and hard work, in making fully-known the life histories of all the most serious pests in the British Isles, and in prescribing the best avail-

able methods of dealing with them. No such work can ever be finished or ever be perfect, but Miss Ormerod has done the task of a pioneer ; she has cleared away the obstructions of ignorance and has laid solidly and well the foundations of a knowledge that requires now only to be kept up and added to as time goes on and changes naturally occur. A further quotation reveals the nature of her work and her recognition of the services of others :

"But the work was hard ; for many years for about five or six months all the time I could give to the subject was devoted to arranging the contributions of the season for the annual report of the year, with additions of the best information I could procure from other sources (in every case, whether of contributors or otherwise, fully acknowledged).... I claim no credit to myself in the work ; but those who will look over the names of the contributors given with their information will see how deeply indebted I am to them, and to other good friends, who have placed their experience and great knowledge at the public service. To them, and to all who have assisted me, and to some who have allowed what began as agricultural communication to ripen into valuable friendship, I offer my grateful thanks and my deep appreciation of their goodness, and I trust they will believe that if, as I well know, much of my work has not been as well done as it would have been in better qualified hands, at least I have earnestly tried to do my very best."

Miss Ormerod's investigations were not confined to insects affecting vegetation and farm products, but included those attacking live stock also. One of her most useful works was her campaign against the Ox Warble-fly, which she conducted with her accustomed energy and enthusiasm until the great suffering to animals, the heavy losses to their owners and the serious damage to hides which it caused became known far and wide. As a result of her work cattle-owners in all parts of the world now know the best course to pursue to rid their cattle of the maggots of the insect, or better still, to prevent the insertion of the eggs that produce them. Corresponding enemies of the horse, the deer and the sheep were also investigated by her, and the results published in the annual reports.

In addition to the four and twenty volumes of Reports, Miss Ormerod published a number of other works on Entomological subjects ; among these may be mentioned the "Manual of Injurious Insects," 1881 ; "Guide to Methods of Insect Life," 1884 ; "Injurious Insects of South Africa," 1889 ; "A Text-book of Agricultural Entomology" ; "Observations on Warble Fly" ; "A Hand-book of Insects injurious to Orchard and Bush Fruits" ; and a number of pamphlets on such subjects as the Hessian Fly, the use of Paris Green, the Turnip Fly, Root attacks on Turnips and Cabbage, etc.

Besides the distinctions already referred to Miss Ormerod was an honorary or corresponding member of a large number of Scientific Societies in Europe, America, Australia and South Africa, Fellow of the Entomological Societies of London and Stockholm, Honorary Entomologist to the Royal Agricultural Society and subsequently Examiner in Agricultural Entomology in the University of Edinburgh. For many years past she was an honorary member of, and took much interest in, our Entomological Society of Ontario.

Miss Ormerod was indeed one of the most remarkable women of the latter half of the nineteenth century, and did more than anyone else in the British Isles to further the interests of farmers, fruit-growers, and gardeners by making known to them practicable methods for controlling and subduing their multiform insect pests. Her labours were unwearied and unselfish ; she received no remuneration for her services, but cheerfully expended her own means in carrying out her investigations and publishing their results. In private life she was kindly and hospitable ; with an old-fashioned courtesy, and the manners and ideas of by-gone days, she and her sister possessed a charm all their own, and the writer recalls with pleasant memories his visit to their home at Isleworth. By whom in England her work can be contined we do not know ; it is not likely that anyone can follow in the unique path laid out by Miss Ormerod. We may therefore, cherish the hope that the Government of the day will hold out a helping hand and,

establish an Entomological Bureau for the lasting benefit of the great agricultural interests of the country. C. J. S. B.

Otto Lugger.

The ranks of American economic entomologists have suffered a serious loss through the death of Otto Lugger, State Entomologist of Minnesota. He died on the 21st of May, 1901, from pneumonia, after a very short illness, in the 57th year of his age. From Dr. L. O. Howard's obituary notice in *Science* the following particulars have been gathered. Mr. Lugger was born at Hagen, Westphalia, his father being a professor of chemistry in a Prussian university. In 1865 he came with his parents to the United States, and obtained a position in the Engineer Corps of the Army; he was engaged for two years in a survey of the Great Lakes. He had always been interested in entomology, and collected specimens during his engineering work. Becoming acquainted with Dr. C. V. Riley at Chicago, he went with him to St. Louis as assistant on his appointment to be State Entomologist of Missouri in 1868. For eight years he continued to be Dr. Riley's "quiet, unassuming, self-sacrificing and devoted helper." At the end of this period he married and removed to Baltimore, where he became the Curator of the Maryland Academy of Science and naturalist of the city parks. Ten years later, in 1885, he was appointed assistant in the Division of Entomology of the U. S. Department of Agriculture and remained in Washington for three years; he then became Entomologist to the State Agricultural Experimental Station of Minnesota and continued to hold this position till his death a few months ago.

"His first entomological experience in the State of Minnesota was one of great interest and importance, and his vigorous and intelligent action in the face of a great emergency fixed his standing as a most useful officer firmly in the minds of the Minnesota farmers. An enormous swarm of the Rocky Mountain locust, or western migratory grasshopper, had settled down in Ottertail County. By Lugger's advice and energetic field work, backed as he was by a public spirited and intelligent Governor (Hon. W. R. Merriam, now director of the U. S. Census), who personally guaranteed the funds necessary for the campaign, the hordes of destructive insects were annihilated and great damage was averted."

From that time on, for nearly 13 years, he continued his active work, issued frequent publications, and gained the profound respect of his constituents and of the scientific men of the country. His more important works were a series of profusely illustrated papers on the different orders of insects found in the State; the parts he was enabled to publish were on the Parasites of Man and Domestic Animals, the Orthoptera, Lepidoptera, Coleoptera, and Hemiptera of Minnesota. At the time of his death he was preparing the parts on Diptera and Neuroptera, which, it is hoped, may have been left sufficiently advanced for publication. The series, if he had lived to complete it, would have formed an admirable manual of Entomology for the Western States, and of use to naturalists everywhere; they were written in a clear and interesting manner, and prepared with great care and accuracy. He was also a good botanist, and published several useful papers on plant diseases.

In 1899 Mr. Lugger, accompanied Dr. Fletcher in an investigation of the areas in southern Manitoba which were infested by the Rocky Mountain Locust during the preceding year, and aided him in the discovery of eggs and freshly emerged young locusts near Deloraine. He also joined with Dr. Fletcher in addressing a number of meetings of farmers in different parts of the province.

He is described by Dr. Howard as "a man of admirable qualities; his wide information, his agreeable personality, and his keen sense of humour, made him a most delightful companion. Many of his stories and humorous sayings are current among entomologists all over the United States, and his loss will be felt for many years to come."

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ANNUAL REPORT

OF THE

BEE-KEEPERS' ASSOCIATION

OF THE

PROVINCE OF ONTARIO

1901.

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ONTARIO BEE-KEEPERS' ASSOCIATION.

ANNUAL MEETING.

The twenty-second annual meeting of the Ontario Bee-keepers' Association was held in the Council Chamber of the City Hall, in the city of Woodstock, on December 3rd, 4th and 5th, 1901.

The President, Mr. John Newton, in the chair, called the meeting to order at 2 o'clock p.m.

At the request of the President, Mr. W. J. Craig, editor of the Canadian Bee Journal, invoked the divine blessing on the meeting.

The Secretary read the minutes of the 21st annual meeting, held at Niagara Falls, which, on motion, were adopted.

PRESIDENT'S ADDRESS.

By John Newton, Thamesford.

It is with pleasure that we meet again in convention. Another year has gone and we are here to talk over the past and to make and lay plans for our future.

The first year of the new century has been very profitable to most beekeepers, not only by the good flow of honey, but by the good prices which have been obtained for our product. I believe that we have as good prices as we had ten or twelve years ago. Surely, this is encouraging. The quality, as far as I have been able to judge, has been extra good. Then as to our prospects for next season, bees in most parts have gone into winter quarters with well-ripened stores, a point which tends a great deal towards successful wintering; the roadsides are matted with white clover, judging from these conditions we may look for a big crop in 1902. I doubt not the most, if not all of you, have come here with the hope and expectation that this will be one of the most enjoyable and profitable meetings ever held by the Association. To make this wish a veritable reality can but be accomplished by each one taking part in the discussions and so contribute their portion of information for the general good.

It was with deep regret that we learned of the sudden death of our ex-President, Dr. Thom, who held the position of President in the year 1884, and was esteemed by all members of the Association. These calls are but warnings to each of us that some day we too shall be called hence to our reward.

It will be remembered that at our last annual meeting a motion was passed to the effect that the Association deem it advisable to make an exhibit at the Pan-American Exhibition. The matter was brought before the Ontario Government, and they decided to help us. At our Executive meeting in May it was my pleasure to be appointed to go to Buffalo and install the exhibit. We made a general call to bee-keepers of the Association to help us. We succeeded in getting a good supply of extracted honey but not a great deal of comb.

However, the extracted and comb were of a very fine quality. Our display was not large, but was greatly admired by all visitors. I might note a few remarks gathered from passers-by and entered in my register book: "Canadian honey." "What part—Ontario." "Ontario is all right. Magnificent exhibit." "Very artistic exhibit and very clear honey." "Grand honey and beautiful exhibit. Am glad I came up-

stairs to see it." "O, look at the purified honey. Isn't it fine ?" "It's very prettily shown up, ain't it. O, isn't it fine ? The Canadians may be slow, but they know how to put up a honey exhibit."

There were only 21 exhibitors in all. We were awarded the gold medal for the collective exhibit of honey, etc., and 33 diplomas of honorable mention for the individual exhibitors. I have to thank the members who so willingly aided us in making Canadian honey so famous at the Pan-American. While at Buffalo I had the pleasure of attending two of the sessions of the National Beekeepers' Association, who so kindly extended an invitation to our society to meet with them. Was pleased to see so many Canadian beekeepers present. Every one reported a profitable convention.

During this year Canadian honey has also been represented at Glasgow, Scotland, being taken from the exhibit which was at Paris in 1901, but I have been unable to find out what awards were given. One of the questions at our last meeting was would it pay us to exhibit at Buffalo, knowing we had a duty of 1 2-3 cents per pound to pay to gain a market in the United States. I feel safe in answering it now, that I believe that it has paid our Association, first, by showing to the world that we can procure a very fine quality of honey in Canada, in fact, second to none, and that we Canadian beekeepers take a pride in our pursuit to put our honey tastefully on the market. I believe if we push for a market in the States, even by paying the duty, we shall gain it, because American people seem to realize that Canadian laws are much stricter than their own. Our pure honey bill is all right, and let every member of our society try to enforce it, and by doing so we shall make a reputation and a market for our product. It will be laid before you for your consideration the advisability of making stronger the bill which we now have in regard to spraying of fruit trees while in bloom. We all know that it is a serious question in some parts of the country to beekeepers. Let us put our shoulders to the wheel and try what can be done.

The Inspector of Apiaries has, as far as I have been able to learn, been attending to the duties of his department in a manner which I trust will be satisfactory to all. His report will, however, be submitted for your consideration. My attendance at the exhibit at Buffalo and meeting with so many beekeepers of Ontario, who do not belong to any beekeepers' association at all, have brought me to think that they do not realize the advantages given to members of the Ontario Beekeepers' Association. I would strongly advise that a small pamphlet be published setting forth the workings of our society and its advantages to beekeepers, and have a copy placed in the hands of every beekeeper of this land.

The matter for forming a guild or exchange will be brought to your notice by Mr. Andrew Pattullo, M.P.P. for North Oxford, who has so kindly consented to take that subject for the base of a few remarks to us.

In conclusion, I thank you for the confidence placed in me a year ago in placing me in the position I now occupy. I trust you will all assist me in making these meetings pleasant and profitable to all while I occupy the present position, for in union alone there is strength.

Mr. Evans : I think I may say to you something as to the President's work during the past year and how faithfully he has carried it out. You know this year there was a great deal more work than usual thrown upon the President in consequence of our exhibit at the Pan-American, and we thought when we took up the matter in the Executive there was no man we could trust so well as our President to look after our exhibit, and we ordered him to go over there and take charge of it, and he has discharged his duties faithfully and well. He was there most of the time during the honey exhibit. He had the trouble of setting it up, the liquefying of the honey, and all the work of taking it down again and shipping it back to Toronto, and we found there were a great many things to be looked after and taken care of that we did not foresee. The subjects that are brought before you, I think, are of considerable importance, especially as to the law with regard to the spraying of fruit trees. I think the law as regards that matter should be as stringent as possible. I don't know that I find any difficulty of that kind in my neighborhood. I think if we thor-

oughly educate the people as to the advantages of bees to their fruit we would not have any trouble. In my neighborhood those who have fruit trees are all anxious and they would like very much if I would send a few bees around. I have neighbors within a radius of a mile and a half, some of whom have never had a failure, and even this year, when apples are scarce, they will have a large crop, and they realize the advantage that the bee is to them. If we educate the people as to the benefit of the bees to their fruit trees we will have very little trouble. We have got a thousand copies of the address of Professor Fletcher, showing the office of the bee in the fertilization of fruit, and those will be distributed, and if they are sent broadcast in the country I have no doubt they will do a great deal of good. I can only say in regard to the President that we have just had the right man in the right place.

Mr. Evans moved, seconded by Mr. Gemmell, that a hearty vote of thanks be tendered to the President for his able address and for his services during the year. Carried.

Mr. Clarke: I am pleased to hear of the success of the Canadian exhibitors in the Pan-American, and I think if our people will only be just to themselves they will always be able to hold their own at home and every other place.

The President: I thank you all for the kind words which you have spoken. I have only done what I thought I ought to do in the position which I tried to fill. One thing I overlooked in my address was that the thanks of this Association are due to Mr. Miller of London for supplying part of the glassware which helped to make the exhibit which we had at Buffalo very attractive.

Mr. Couse moved, seconded by Mr. Brown, that a vote of thanks be tendered to Mr. Miller for his kindness. Carried with applause.

EXPERIMENTS WITH FOUL BROOD.

By Prof. F. C. Harrison, O.A.C., Guelph.

The work that has been undertaken this year upon foul brood has been rather limited. Last year a large number of the results of experiments were given to this Association, but no such extensive work has been done this year. The only thing that has been attempted to be done is to try and find out if possible some means of destroying foul brood spores and foul brood germs as they exist in the honeycomb and as they exist in the dead larvae of the bees. And I am pleased to be able to tell you that one remedy which has been tried on combs has met with good success. I know that I occasionally run against Mr. McEvoy and his method, and my only object in doing so is by means of discussion, and by means of experiments to try to get a method which shall be cheaper and take less time than this present one, or the starvation methods that are so used in this Province.

The method which has been employed is—and I may say that we have very good facilities in the neighborhood of Guelph for obtaining foul brood colonies—that we have taken a large number of these and have disinfected them with vapors of formalin. This was done somewhat in the following manner: Pieces of comb were taken out—large sections—and were confined or placed in a box the same size as an ordinary hive. The exit at the bottom was plugged up with the exception of a small hole, and a small opening, about half an inch, was left at the top. To the lower hole was affixed a formalin gas apparatus—this is very simple, and could easily be manufactured by any local tinsmith—it consists only of a small alcohol lamp at the bottom, with a reservoir at the top which contains formalin. Formalin, I might say, is the trade name given to a 40 per cent. solution of formic aldehyde gas in water. A small portion of this is put in the reservoir over the alcohol heater and then the top is screwed down. The top connects with a small hose pipe and it is placed in to lower hole of the hive. Directly after the apparatus is attached the alcohol lamp

is lit and the formalin is vaporized and spreads throughout the hive. This means of disinfecting the hives was used, and the wax of the comb that was placed in it was several years old, judging from the looks of it, and contained dead larvae, dead or foul brood, and also contained a certain number of capped cells; so that probably all the conditions were present which would be met with in a bad case of foul brood. After the gas was liberated through this hive and, from the smell of the gas, was issuing from the hole at the top, this top hole was closed and almost immediately afterwards the formalin apparatus was disconnected and that lower opening plugged up, and it was kept there for one hour. At the end of that time the hive was opened and the combs taken out, and a careful examination made not only of the capped cells but also of the foul brood cells, and also certain marked cells which contained honey and also spores of foul brood. In not a single instance did foul brood germs grow from this colony after it was treated. And since then I have performed the experiment three separate times with three other distinct combs, and with the same success, that in each case the germs were killed, whether they were in dead larvae, whether they were in honey or whether they were in capped cells.

Now, it is well known that formalin under the pressure it gets there has a great deal of penetrating power, and that probably accounts for it. I think that this method would be quite practicable in an ordinary apiary, especially so when one considers the small cost of the apparatus, which could be manufactured, or any of the apparatus which are at present manufactured for the disinfection of rooms in hospitals are quite applicable to this same disinfection.

One word in connection with the remarks I made at your last meeting. At that time I told you that we had in the laboratory at Guelph a large number of small pieces of glass which had been spread some years ago with foul brood spores, in order to find out how long they would live when deprived of food and fresh air, exposed you might say to dryness. They are in semi-darkness, a darkness of a drawer, which is occasionally opened and shut; and I usually take these out at six months intervals to see if they are living or dead. They have been there nearly four years. I looked at them a few days before coming to this meeting and found they were still alive. So that in dealing with these foul brood spores we have a low form of plant life which is extremely resistant to dryness.

These, then, are the experiments which have been performed this year, and I trust that in your practice you will give some opportunity for trying this formalin method or fumigating method for foul brood.

(Prof. Harrison during his address made a chalk diagram on blackboard of formalin apparatus.)

Mr. Evans: This is one of the most important discoveries I have heard of yet in connection with foul brood, because even though we should continue to practice the starvation plan this would be of great utility in disinfecting hives and combs. With regard to combs from hives that die, we are doubtful whether we can safely use them again, and this system would at least save these and make them fit to be used again.

Mr. Hall: May I ask if Prof. Harrison, when he speaks of capped cells means capped honey or capped larvae?

Prof. Harrison: Capped larvae.

Mr. Gemmell: I am sure this address has been quite an interesting one to all the beekeepers here. If we can find out a better method than we have now we ought to hail it with delight, and in the meantime we will keep on in the old way until we know of a better. I see the great value of this system is with regard to combs. We have sometimes four or five hundred old combs, and we are a little doubtful of them having been in connection with foul brood, and I see a great value for many cases in that system. Of course, we can kill foul brood, but if we could cure the foul brood in the combs without melting them down it saves us a great amount of money.

Mr. Darling : I would like to ask Prof. Harrison if the bees were disposed of how we would manage with combs that have live brood and larvae ?

Prof. Harrison : In that case I suppose they would suffer the same death as the other. This treatment is for combs only.

Mr. Gemmell : It is certainly a grand thing if we can keep combs we are not very sure of, and fumigate them by that process and be sure they are all right. Of course it is going to be a still greater advantage if we can destroy the spores in the larvae.

Mr. Evans : I think it would be of great importance to have some experiments made by shaking the bees out of a foul broody hive and after the experiment put them back again and see how they work.

Mr. Hall : You can set them aside for three weeks until everything is hatched out, and then you can keep those combs and honey and all.

Mr. Smith : Does the experiment you speak of make the combs in any way objectionable to the bees ?

Prof. Harrison : No, the smell soon passes out. I know you can place the most delicate silks dyed by delicate analine dyes in this vapor and they will not be hurt by it.

Mr. Smith : Have you experimented in the event of foul brood larvae dying in the cells ; do the bees remove that sufficiently ?

Prof. Harrison : As a rule I do not think they remove it ; I think it lies down there in a sort of scale. I know I have often found dry scale containing foul brood germs.

Mr. Darling : Would this vapor kill all the germs in that dry scale ?

Prof Harrison : Yes. The scale was not perfectly dry, but it had not sufficient moisture in it to string.

Mr. Gemmell : Do you think it is possible to kill the germs in combs that have been drying down for two or three years.

Prof. Harrison : It is better if there is a little moisture present undoubtedly, because I think the gas joins with whatever moisture may be present, and you get the disinfecting effect from it.

Mr. Darling : Is there any danger of any explosion from that ?

Prof. Harrison : No.

Mr. Brown : You would consider those combs perfectly safe to return to the hives ?

Prof. Harrison : Yes. I have made a careful examination and found nothing. You can control it absolutely.

Mr. A. Laing : As I understand, the combs are perfectly cured of foul brood germs when Prof. Harrison is through with the experiment. If such be the case, as I understand, why cannot the bees go back on those combs for, say, a period of probably ten days or a couple of weeks, and shake the bees off again when the honey which they would have contained in their honey sacks, which might have been affected with foul brood, would have been stored in the cells, and then by treating the combs again and putting the bees back on them again, you would have the same disinfecting effect. You would have the bees clear of it also. I think probably by this scond treatment we would accomplish the same object as by the present methods, and get an absolutely perfect cure of the disease ; and this certainly would be a very much cheaper method than the way we are doing the work at the present time.

Mr. Gemmell : Why not shake the bees from the combs and put them on to starters and allow them to remain there ?

How long were the combs away from the bees altogether ?

Prof. Harrison : Oh, they might have been away eight or ten hours.

Mr. Hall : In that case you would kill all the brood ?

Prof. Harrison : Yes.

Mr. Hall : In the old fashioned way we are doing it we can save that brood.

Prof. Harrison : These were very bad ; they were the worst I could get. I fancy you can stop the growth of the germs in the hive by putting some formic acid with the sugar syrup, if you are supplying them with that. I kept that up for three or four weeks, and I could not produce the disease even when I was putting in spores by the million

so long as I kept the formic acid in, but directly I took it away the disease started at once.

Mr. Hall: We are so busy in our honey season it would cost us so much to do it we would lose money; and by shaking them off on to foundations, that is, on to starters only, they are cured so far as they are concerned; then you have to attend to the brood. All you have to do is to get a few nurse bees to attend to the larvae. After that the bees are hatched out, and we can then shake them off or burn them as we choose. Where I see the benefit comes in is in saving the combs that we do not like to melt up.

Mr. Holmes: I think Prof. Harrison wants us to understand that if there is any remaining living brood in those combs that are being treated it is destroyed.

Prof. Harrison: Yes.

Mr. Holtermann: The question of foul brood is one in which I take an interest, and I believe that as far as beekeepers are concerned, there is a tendency to despise scientific investigation. We do not perhaps do it in words, but we have these investigations, and we practically ignore them and go on with our old methods. Now if we are going to advance in our methods in beekeeping we cannot do that I believe any faster than when we try to combine practical knowledge with science; and in this investigation that Dr. Harrison has made here it seems to me you have that as a result. As Mr. Hall has said, we will be able to use combs that have foul brood germs in them, or may have them. Now, as far as saving the brood is concerned, that can be done just as before, and then when that brood hatches out, then if there is any capped honey I should say extract it, and then disinfect the combs and we can use them again. As far as Mr. Laing's statement goes, I see this difficulty. If you return your bees at once to those combs they put the honey into the cells; and the second time when you shake the bees the chances are they may again take some of the infected honey, and you could not get rid of the disease.

Mr. Laing: That would apply to the McEvoy method also.

Mr. Holtermann: Not to the same extent, because there are whole combs in which they can store the honey.

Prof. Harrison: I might say that we are always pleased at the Agricultural College to undertake investigations along these or other lines which you may be interested in; for instance, in insect pests or in any line of chemistry. The only thing in which we ask your indulgence is this, that it would be manifestly impossible, with the strength of the staff at the College, to investigate for every person what was troubling him particularly; but when you see a disease, or a pest, which is bad in your district which is affecting not only yourself, but others in that district, and where you conceive that it is for your own good, and for the good of others around you, then we shall always be pleased to act, and not only to give you advice, but to make a personal visit and to thoroughly investigate it. It is only by your hearty co-operation in matters of this kind by supplying us with such material that we can help one another. You help us by sending us this material for study, and we can help you probably by means of our facilities there, and possibly by greater expert knowledge. Where a person is in a certain line, or where he is specializing in it, where he has sources of information at his disposal which are not at yours in the matter of books, laboratory appliances, and so on, then I think probably it would be to your advantage as well as ours to co-operate in this manner; and we shall always be pleased to do it, whatever department it may be in, whether it be entomology, or a question in agriculture or chemistry or bacteriology in connection with diseases, or any other item that may come up.

Mr. Frith: You have just carried on the experiment for this year in regard to the foul brood?

Mr. Harrison: No; I have been working at it for five years.

Mr. Couse: I think it wise, since Prof. Harrison has offered to do certain work for us for our benefit, and for the benefit of the Province, that we should take some action. He is very anxious to get hold of samples of black brood, if it is possible, and I would move that the President for next year or the executive committee—even if it is necessary to take funds to do it—procure samples of black brood from the State of New

York, or wherever they can obtain them, and send Prof. Harrison samples, so that he may experiment with them. Mr. Holmes seconded the motion, which was carried.

ADDRESS OF WELCOME.

Mr. J. B. Hall then delivered the following address of welcome on behalf of the Oxford Beekeepers' Association : Our Association has given me the pleasure of welcoming you to our midst and to our city, our industrial city, which I do most heartily, and I hope that you will have a pleasant and joyous time. The discussion which has been going on so far has been very profitable, and instructive ; and I hope we will take home with us a great deal of information that will be for our future good.

I may perhaps be permitted to make a few remarks in reference to your society, being an old member. There are some perhaps amongst the members who are young and do not know perhaps what you have done. As all of the older members will know, the father of your society is the Registrar at Owen Sound, Mr. McKnight. Without Mr. McKnight you might have had a society, but you would not have had it for years after you did. He was the one who called the meeting at that time ; he was enthusiastic ; he had just commenced beekeeping. Your Association has accomplished something. In 1886 you got incorporation for the Provincial Society, and with that incorporation they gave you a grant for the dissemination of the knowledge of beekeeping to the world at large, more especially the Ontario world of beekeepers. That has been used to great advantage, and we ought to be thankful to the Association for that.

The next they gave us was in the same year, 1886 ; the Ontario Government made a large grant to pay four gentlemen to go to Britain to the Colonial Exposition there to exhibit our Canadian product, which they did to advantage, as far as the honey producers of Canada were concerned, and to the delight of the Britishers. It surprised the Britishers, although it gave them an erroneous idea in one particular ; they thought we were a race of giants. These men did us great service, and I do not know that we have thanked them sufficiently for it.

We come down to 1890. We had been troubled with foul brood. It was disseminated in our colonies. I felt pretty sore on the subject ; I was very glad to have somebody act. In fact the Oxford Association was started with the idea of getting a law to prevent the spread of foul brood two years previous to the inauguration of the Ontario. You have been of great service to Canada, to Ontario and to the apiarist. At the same time they gave us that law they gave us also the privilege of approving of a fit and proper person to examine all apiaries complained of or informed about, whether it was yours or someone else's. Then we chose a very efficient man, who has done good and steady work. And they have accepted our nominee ; they have paid his expenses from that time to this, and he has done grand service for us. And I, as an individual, thank you as an Association for that, and I hope we shall long retain his services.

We come down now a little further upon the way. We had a great fight between the apiarists and the agriculturists in the spraying of fruit in the wrong season. Although it is a grand thing, there were a great many pig-headed ones amongst them ; there were some of them that did not know and some that did not care ; they would spray and spray at the wrong time. There were many that had no use for spraying simply because the bees were destroyed by taking honey from fruit that had been poisoned ; but the work of Prof. Fletcher has enlightened not only the beekeepers but the fruit-growers, and instead of being enemies they are friends; they know they are working each for the other's interest. We cannot have fruit to advantage without bees, and we cannot have honey to advantage without the fruit. We are friends now instead of being enemies as we were before, and you Ontario people may be thankful for that.

We come a little further down, to 1896, and we find that in years previous to that our country had been flooded with spurious honey ; some by our own citizens—although, of course, they were not good citizens—and some by our brothers across the line. They were putting on our market a very choice looking article called Pure Canadian honey ;

and you appointed delegates, and they, with hard work and persistent work, enlightened our authorities at Ottawa to the fact that this thing should not be allowed any longer, and they graciously attached to the Pure Foods Act an amendment especially for honey. And I am very glad and very happy to say it has done a great deal of good, not only to the honey producers, but to the consumers. Of course we have the privilege as individuals and as societies of reporting any suspected article, and the Government are so kind they will do all they can by sending their own servants to buy up the stuff, and they have their own witnesses and they will do their own analyzing, and they will prosecute those that are offending against decency and order and law. We certainly ought to be thankful for that.

Mr. Clarke: What was the spurious article found to be?

Mr. Hall: Found to be principally glucose. We also have to thank you for the work you have done in Chicago, and also at the late fair at Buffalo. We have educated the people to know, not that we live in the land of frost and snow, but in a land that is prosperous and rich, a good land, flowing with fruit, milk and honey of the choicest kind. These we should not have had, and had so bountifully, if it had not been for the economy of the gentlemen who form the executive of this association. I think we, as beekeepers, old and young, should be thankful for the Ontario Society and for what they have done for us as an Association.

Mr. Evans briefly and wittily responded, paying a high compliment to the Oxford Beekeepers' Association as the oldest and one of the most advanced bodies of beemen in the Province. One of the weak points he found in connection with spurious honeys, was that if complaint was made to the Inland Revenue Department, they would send out and buy not from the retailer, but from the wholesale man who makes it up. He knows who they are, and sends them good honey; but in retail stores you find it. Mr. Evans said he had seen it this year in Toronto, plenty of it, sold in the small stores; but it seems difficult to get the right party prosecuted.

MANAGEMENT OF OUT APIARIES AND PREVENTION OF SWARMING.

By H. G. Sibbald, Cooksville.

Your committee could not have struck a subject more difficult to write upon, and yet of such live interest to the progressive beekeeper of the new century. Mr. Hutchinson calls it the most hopeful field to which beekeepers can turn their attention, and says "keep more bees," which means "out apiaries."

There was a time when extracted honey brought from 15 to 20 cents per lb., and comb honey was proportionately high; when the forests were plentiful and filled with basswood (that grand honey tree), now almost extinct. These forests, in addition, contained and retained moisture, and drouths were less frequent in consequence. These forests also sheltered and protected our most valuable honey plant, the clover.

Now new and undesirable conditions prevail, prices of honey have declined. The forests have been cleared away, drouths are all too common, and our clover is frequently winter killed, which makes the production of honey a more uncertain and less desirable occupation. Honey crop failures occur with uncertain but too frequent regularity, until the apiarist with 80 to 100 colonies, depending on them alone for a living, finds himself poor indeed, and must of necessity turn his hand to something else that will combine with beekeeping and aid him in making a fortune, or at least in keeping the wolf from the door. Farming, fruit-growing, poultry and other things have been tried with varied success, but almost invariably to the detriment of the honey bee and the loss or sacrifice of the honey crop.

This seems to be an age of specialists, and our thought, time and attention must be concentrated upon one thing to make the greatest success of it. This can only be done, and the above noted changed conditions met by increasing the number of col-

onies kept, so as to make provision in the fat years against possible lean ones. But the difficult part is to tell you how to do it, and a saying I've heard comes to me and seems quite appropriate. It is "The more I know, I know I know the less," and so venture to give help on this "new hopeful" field with fear and trembling.

To commence with, then, our apiaries ought to be so situated as to be within driving distance, and yet three or four miles apart, and suitable yard with buildings adjoining, and cellar if possible must be found; if with friends who will take a kindly interest and prevent molestation, all the better.

The uncertainty of honey crops and the difficulty of securing competent help at the right time makes it desirable that some system of management to adopted that will not require the constant attendance of anyone in any particular aplary, so we must, therefore, clip all queens to prevent absconding swarms, while we bring all means in our knowledge and power to bear on the prevention of swarming, which is advantageous in any event, whether one yard or more are kept.

The first step toward this end might be to have young queens of a non-swarming strain (if such exists), or at least chosen for their virtue in that direction.

The second step might be to equalize all colonies in fruit bloom, checking the strong and helping the weak, so as to have all as nearly as possible in the same condition, so that a yard can be manipulated together, all supered and extracted at the same time, etc.

The cause of swarming, as far as I understand, is the natural instinct of the bee when crowded and a honey flow on—so that it will be seen that the 3rd step would be, to anticipate their condition and wants and provide room before they notice they are crowded; this necessitates having plenty of combs ready, two sets for each hive will be found convenient and almost necessary. The first super might be put on at the close of fruit bloom if our bees are reasonably strong, and the second one shortly after the clover flow starts and before the first is nearly full. All hives ought to be blocked up from the bottom board to allow ventilation, using either a wedge or blocks behind. Shade trees will be found helpful. Use sun caps also to keep the hives shaded.

Then our real work commences, and we must get a move on to keep pace with our industrious pets. We must study the actions of the bees, so as to guess their condition by a glance at the entrance and a peep in the supers. If they are working well at the entrance and storing honey rapidly all is well. More room may be provided; but if they are hanging out, sulking, acting queenless and not working when other colonies in normal condition are doing well, an examination of the brood chamber is necessary, which may reveal cells started, no eggs, probably queenless, etc. It is useless to try to tell you here what to do in such cases, as time will not permit, and, besides, these little details are known to all. By visiting an out apiary once a week and running over it in this way, you will catch nearly every swarm and spend very little time over it.

Inexperienced help can be procured to help in extracting, and a splendid crop can soon be harvested if secured by the bees. All work must be quickly done, and any tinkering or slow method dropped, wholesale manipulations must take their place.

Mr. Sibbald then added the following extempore remarks: In my paper I did not explain fully that if a swarm issues during the time you have not been there it cannot get away for a few days after because the queen is clipped and the young queen will not have been hatched; and if you come along and find them in that condition it is a very easy matter to destroy the queen cells and prevent them from getting away again. And then there are other plans, too, that you all know of that may be brought out in the discussion that can be used on a hive to put it in condition to work again.

Mr. Gemmell: How are you going to know they swarmed unless you examine the hive or someone saw them swarm?

Mr. Sibbald: A little further on in my paper I intended that to be understood. A hive that has swarmed or is in swarming fever never, to me, seems to do anything like the work that a good hive working quite nicely does, and a glance at the entrance will reveal that fact; and perhaps they are hanging out, not working, and then

I look in; the super will show you that the bees have not stored the amount of honey that might be reasonably expected, and that the bees in other hives alongside of it are doing. You have not time to go into the brood nest of every colony and you must adopt some quick method of getting over it, and if you are very observant I do not think you will miss very much; you will soon catch a colony that is queenless or that has swarmed, and the queen has returned after; they will not be doing anything; they are sulking, as it were.

Mr. Smith: Practically, I am only a beginner in running out apiaries, and I have a lot to learn in that line. I have done some work, however, especially this last summer. There is one point I noticed in Mr. Sibbald's paper. He spoke of putting the first super on after the fruit bloom. In my experience with a good colony that would be too late; that is, they would be so crowded they would want to swarm before I would want them to. In an ordinary strong colony I find that they need another set of brood combs, probably at the beginning of fruit bloom. And when the honey season commences I very often take that brood off and distribute it amongst those that are not so heavy in brood and so equalize them, and then they are ready for the extracting supers. I find it necessary to have more than two supers to give them room enough. Of course, I have to do it all myself, practically; I have no help. I have three yards, and on some of them I put on as many as four supers and that reduces the sense of swarming very materially, and then at the end of the season I put on extracting supers and remove the comb supers. If you choose, those that have swarmed or furnished themselves with a young queen you can put sections on them without much risk of them swarming again, and by attending to them once a week they don't want a super much oftener than that. You cannot tell very much about them, only just by a glance at the entrance; that will give you a pretty good idea of the position, but it does not in every case. We find we have to go through quite a per centage of them, but with a yard of 75 or 80 colonies we can get over all that is really needed through the height of the honey flow and if there is a swarm or two comes off at the end of the flow it does not matter much. Then I have had to do the most of my extracting after the honey flow. Some do it before, but I find a good many do not have as well ripened honey as if they had left it till the end of the honey flow, and if you take it off at the end of the basswood flow you get it pretty well ripened. I find it difficult to get help at the right time. The principal thing is to have everything in the way of supplies on hand at the out yard and a suitable building for it.

Mr. Miller: I have a different system of management in my out yards. This season I visited them once in four days. I can run probably another yard and visit not so frequently and do all the work myself. But having the time, I visited it once in four days. My hive is so constructed that I can examine it more quickly than to lift the covers and wait to examine the entrance. I simply divided the brood chamber, and in an instant I can tell the stage the cells are in, and know just what to do from that. But the systems are quite different in management and I don't think I could draw out any discussion.

Mr. Gemmell: Mr. Miller uses the Hedden hive.

Mr. Chrysler: I have not kept an out yard at all; I have a very small apiary myself, but I have been anxious to learn how to do a great amount of work or accomplish a great deal with a very little labor. I have a few Hedden hives and I have other kinds of hives. I have managed the Hedden hives for two or three years without a swarm from them or, I might say, even queen cells. I have taken probably three brood chamber sections when fruit bloom is on, and when the queen has pretty well filled the two sections I take the empty brood chamber and set under the other two, and take one of the upper ones and put a queen excluder between that and the next one, of course putting the queen below. Then when honey is gathered as a general thing will be put in the top brood chamber and as the bees are being hatched out that will be filled with honey, and by the time that is pretty well filled you can generally put an extra super under that of extracting combs. But if they were pretty well filled and sealed I find no danger in putting sections under it. You have

then got your bees thoroughly to work up above, and they never think of swarming and they have got a big space below, so that if they really have got to have more room below they can build on those starters, and before they really get them full your honey season is over. That half of the brood chamber is filled solid with honey. It makes, in my locality, a kind of honey that is not fit for sale though it is fairly good honey for wintering.

Mr. McEvoy : Did I understand you to say you put starters on ?

Mr. Chrysler : Very shallow starters, probably sometimes none at all if I intend to scrape them out again and do away with the combs at the bottom. They occasionally will breed enough so that it is inconvenient to scrape them, so I put starters below them. That extra half brood chamber is filled with solid honey that I save for wintering. I put that in the empty brood chamber underneath for wintering. They have all sealed stores, and the queen very seldom lays in them until the winter is far advanced, and I think with that system, followed out in that way, a person has no need to look after their apiaries so often. I think, as far as I have tried, that it will work satisfactorily.

Mr. Smith : How much surplus room would you give those colonies ?

Mr. Chrysler : Of course I would keep adding supers underneath the other half chambers for brood and probably I might set it away. I have left it on the whole season through; if it is warm it will keep ripening more yet and it gets like wax; that is, the honey will get so thick that it still improves for winter use.

Mr. Dickenson : Do you say you keep that in supers underneath ?

Mr. Chrysler : Yes, underneath, on top of the queen excluder.

Mr. Frith : One question in regard to these out apiaries, are they a paying concern; do they bring in a sufficient revenue to warrant us in investing along that line. I will simply ask all those who have out apiaries.

Voices : Yes, yes, yes.

Mr. Smith : I can give one illustration where it didn't pay. A year ago we had a very light crop in the city, and I was under the impression if I got those bees moved into the country they would be sure to do better. It so turned out that the bees I moved did not do nearly so well as the yard I left in the city this year.

Mr. Frith : Was it a losing concern ?

Mr. Smith : No.

Mr. Hall : It simply proves that Mr. Smith is not a prophet. he does not know until after the thing transpires. I have kept out apiaries, and if I had to do away with my out apiaries I should have to do away with my bees and do something else for my bread and butter. They have given us much more honey than the colonies in Woodstock. My friend Sibbald is a little mistaken about the clover. It is an autumn plant; it dies through August. Don't say winter. White clover is a northern plant.

Mr. Sibbald : I don't know that. I speak of alsike clover.

Mr Hall : White clover won't winter kill.

Mr. Sibbald : You may be right about it being killed in the fall. It is killed between the seasons.

Mr. Hall : It gets roasted. Before the cows were shut off the commons we had land in this vicinity that flowed with milk and honey and a lot of honey, too; but they have shut off the cows and they don't give so much milk because they don't get so much pasture, and we get precious little honey; we have to move out to get it.

Mr. Craig : There is nothing in the statement then that clover is winter killed ?

Mr. Hall : You can't kill white clover in the winter.

Mr. Brown : It appears to be winter killed here and summer killed with us.

Mr. Byer : If Mr. Hall was in York County he would not get five pounds a year from white clover. Our surplus all comes from alsike. It does occasionally winter kill. Two years ago it was a total failure; it nearly all killed in the spring. The night frost heaved it up and gets against the roots and it is dead. Mr. Sibbald thought we should all be able to tell by going through a yard just the state of the colonies. Mr. Sibbald is an expert, and he may have succeeded. If I were to depend on that I

am afraid I would make a huge failure of it. From what experience I have had I find it pays me to have someone there. It doesn't cost much to hire a boy to look after the yard for, say, seven or eight days when the swarming is likely to come on. It is no small thing to have a number of colonies swarm just right in the height of the honey season. Last season we got a large surplus, and it was all in about two weeks. I think the most of us would get a little astray if we relied on observation. I know I wouldn't depend on my observation alone.

Mr. Hall: Mr. Chrysler's plan succeeds with him, but if he comes to Oxford County it won't succeed.

Mr. Gemmell: If he comes to Stratford he will not succeed. I have had them swarm with the queen having the use of five of those half hives, as you call them; and on a half story of foundation, giving them all the room they wanted. I have had them swarm in eight days from that. Circumstances alter cases.

Mr. Hall: You can give no regular rule for any locality. We have bees in three localities; if the man that ran the east one would run them the same as the other two he would run them into the ground, and it is only nine miles apart. We are all of us confident what we will do with bees, and what they will do with us, but we never take into consideration the locality, and, sometimes, it is the race of bees. As far as our friend Miller's contention is concerned, we can look in a Langstroth hive or one of the old hives as easily as we can in the Hedden. We only take out one comb, and we can tell from one or two combs at most what is to be done. You can go through them pretty nearly as quick as you can with your Hedden hive. In your case if you have got 200 pounds on top you are not going to lift it up, and I am not going to lift it up, and if you have a pretty good stock of bees you want that. I can go on just as well with that old-fashioned hive, and I can get just as much surplus honey and we can keep them down in the swarming just about as well as we can in the Hedden hive. The locality is never taken into consideration. The man is a small factor in it.

Mr. Pettit: In the distance of nine miles how do you account for the difference?

Mr. Hall: Simply in the flow of honey. We have no flow of honey in Woodstock after the 21st July, and our big flow nine miles east commences on the 9th of August. The reason they should be kept differently is because we can take every ounce of white honey from these bees, with the others we have to leave 35 pounds to live on through the winter.

Mr. Miller: Up until the time there are two supers on them I never remove the cover, which I think will make a great difference. Every man using the Hedden hive acquires a system of management, adopting short cuts as he finds them necessary. I never remove a cover up until there are two supers on, therefore I claim I can open two hives and find out the condition while you are examining one. Even with 100 pounds on I lift off the two top supers and simply set them down; I lift the other two down and make my examination without removing the comb, and I can do it more quickly than you can lift off your supers; and it is the time that is essential in examining. I have handled my yards alone; I handled the three yards and could have handled another, possibly two, up until extracting time; but I could not do so with the hanging frames.

DEVELOPING OUR AGRICULTURAL INDUSTRIES.

By A. Pattullo, M.P.P., Woodstock.

I have listened with very considerable interest to the paper that was read, as I have to the subsequent discussion. Mr. Sibbald happens to come, I notice, from pretty near where I myself was born. I noticed in that paper that you bee-keepers have your troubles; that you have not good clover sometimes, and you have not got much basswood left. I know that you in this meeting represent a very large and growing interest in this

country. I have always felt, without knowing anything about bees myself, that there was a field in this country for the honey-making industry, and I have been very proud of the record which you have made at the Pan-American Exposition this year. In doing that in your quiet way, unobtrusively—you have done it as you have done all your work in the past—you have performed a national service, and I believe you have beeen laying the foundations of work that will tell, not only to your own profit, but to the profit of this whole country.

Although I am not yet an old man, I remember well when an old personal friend of mine, Mr. Dunn of North Oxford, went to the Centennial Exposition, along with Mr. Ballantyne and Mr. Coxwell and others, and took some Canadian cheese there. Our cheese at that time was almost entirely unknown. They achieved a triumph there which has been enlarged a hundred-fold in importance since. The people of Canada did not realize what these quiet, modest men were doing at that time for this country; they were establishing a reputation for Canadian cheese which has brought us millions upon millions of dollars in profits since. That is a very strong statement, indeed. I do not need to trace the history of the cheese trade since that time, but it was the success of these quiet men on that occasion which first attracted the attention, not so much of the people of the United States, where the Exposition was held, but of the people of the old land, who have since been buying our cheese in enormous quantities.

Some years ago there was an agitation in this country to the effect that after we had developed our cheese industry we ought to develop our butter industry. I am using this by way of illustration and, I hope, encouragement. Some of us had been agitating for some years that there was no reason why our butter should not get as good a reputation in England as our cheese; and it was a remarkable thing—I have just seen a statement to-day that the export of Canadian butter this year has doubled in one year; it was three millions last year and six millions this. Now that is an extraordinary fact. There is room for encouragement there.

If I had time to dwell upon them, all these branches of agricultural industry have been developed and improved, largely by gatherings of this sort—of Associations of this sort—of men coming together and conferring and discussing as you are doing here. Do you know what has been done in a few years in the poultry industry, and that it is developing to such an extent that I am satisfied with the authorities upon that subject—and I know a little more about chickens than I do about bees—that after a while we will be sending five millions of dollars worth of our best poultry to the British market; and in not very long we will be sending ten millions of dollars worth a year. That is a stupendous figure for us to aim at, but I am really satisfied that will be reached, because the capacious maw of John Bull can never be satisfied.

Now, why do I dwell upon these matters? Simply because they are related to your industry. You have established a reputation at the Pan-American which I am satisfied will live in the United States; you have surprised them, but, more important, you have shown a great many visitors from the old land what Canadian honey is; and, equally important, you have taught your own people, who are ignorant, perhaps, to a large extent, and a great many of the consumers and people who consume honey in this country, and ten thousand people in this country who might be taught to use honey much more than they do, if they knew its virtues, because these habits can be increased, as has been seen in a great many lines of industry. For instance, by way of parenthesis, the American people have expended enormous sums of money to induce people, and attracting other countries to use Indian corn in order to consume their vast product of Indian corn. So I believe you in this country by establishing a reputation for your honey and encouraging its use, can develop the home market very much indeed. But the foreign market is to a large extent, I believe, untouched. I believe there is a vast market there for the Canadian product if you can only reach it. I remember some years ago at the Colonial Exposition we made great advances, as I see, from that, but what struck me more than anything else in visiting that Exposition, and in going through England, was the ignorance of the British people of the Canadian products. You have got to cultivate that market and you have got to get into it, if you can, by your own efforts.

Now, the point to which I am coming, and this is all I desire seriously to say to you because I cannot discuss most of the subjects that you are discussing here, inasmuch as I simply know nothing about them, but I have observed this industry, and I have thought a great deal about it, because I am rather proud of the number of bee-keepers there are in the County of Oxford and the excellent position they occupy in relation to the industry. It has often occurred to me that united effort upon the part of the bee-keepers would be the secret of getting your product into the British market. This is the day not only of specialism of large things, as your friend here has been telling you, but it is a day of association ; that is the key-note of everything. Now I suppose none of you are engaged in this industry in a large way; that is in the very nature of the industry itself, and you have probably not the facilities of sending your product to British consumers that are necessary, but if by concerted action, if by united action you can devise a plan by which your honey could be classified and forwarded to the British market and handled there by responsible agents representing you, it seems to me there is an opportunity which would work wonders in your industry.

We have not got a commercial agency in London ; it is largely a diplomatic affair over there, under Lord Strathcona. I regret we have not. I am one of those who have felt for a great many years that we ought to have a commercial agency there, specially devoted to Canadian exports and Canadian products, but there are agencies of the Government which probably might be utilized by you in that respect. You know how active, for instance, Prof. Robertson is who is connected with the Department of Agriculture. I am sure he and others would do all they could for you in that respect.

My sole object in rising is to throw out the suggestion that in view of your splendid success at Buffalo that there is a practical business question for you gentlemen to discuss while you are here, and I feel very confident that out of the discussion of it, and out of such action as you may take, there is a very bright future not only at home but abroad for Canadian honey.

The President : A Mr. Slayden from the old land was visiting at Buffalo, and he and I had a long conversation upon our product and upon reaching their land, and speaking of quantities that could be used over there ; and he desired to have some samples with him, which I gave him, both of clover and basswood honey. The main objection has been that they would not accept basswood honey over there, and Mr. Slayden told me they never knew it by that name ; he said, they have never been getting basswood honey or they never would refuse such honey as that. And he said he felt confident that if such basswood honey as we produced in Canada should go to the old land that they would accept it every time. I see on page 133 of the Canadian Bee Journal of this month there is a short letter which he has written of the Exhibit at Buffalo.

Mr. Gemmell: I am very pleased to endorse what he has said with regard to Mr. Pattullo's visit here. At our local convention a week ago last Saturday it was resolved that the Oxford County Association bring the matter before the Ontario Association with regard to having something done about sending honey to the old country. While in California a few years ago, they formed what was called a Bee-keepers' exchange, and I think the idea here would be a very good one. I think if we formed some kind of an Association by means of which we could have a good grade of honey placed where it could be inspected and shipped to the old country as a first-class article that we would get rid of quite a lot of honey. Although I am not a resident of Oxford County, yet I have been a member of the Oxford County Association, and I am proud to belong to it, and I expect to belong to it as long as I am able to keep bees.

Mr. Frith : It was found that to the fruit men especially, and those who had organized along the lines spoken of by Mr. Gemmell, in California, it was a great benefit to their industry ; it made uniform grades and they received far better prices and they were able to dispose of their surplus to very much greater advantage. I am satisfied if this Association could gather together the product of the bee-keepers of this country and sell it through some special agency that it would be far better for us financially and in every other way.

Mr. Brown: While encouraging the foreign trade, my opinion is, from my little experience in bee-keeping and in the production of honey in the last fifteen or twenty years past that the encouragement of the home market is ahead of the foreign market. Where a few years ago I would sell to customers probably a five or ten pound tin, to-day with the very same customers it is by the one hundred pounds. There are many customers in Canada who know little or nothing about honey; they use but very little of it. A few years ago it was looked upon as a luxury, and too dear and too costly and too far away for them to reach. To-day it is becoming very much different. I think if it were encouraged in the city and country at home we would have less to ship to the old country.

Mr. Couse: I agree with Mr. Brown. Canadians are having confidence in Canadian goods, and I believe the reasons are, we are taught by our Governments and by ourselves that we must do things right. We are getting into the habit of succeeding in anything we undertake, simply because we go at things in detail and follow them out. I had a good many discussions while in Buffalo this summer, and I am satisfied that Canadian people have confidence in Canadian honey very much more than the American people have in American honey. (Applause.) Why is it? Ever since I have had anything to do with the Ontario Bee-keepers' Association we have been teaching good honey, and we are having better honey than we had years ago, and to-day we can sell our honey at home. I don't believe we need to go out of the home market at all. We have brought our honey before all nations and we are beginning to believe now that we have something that is good, and the people of the Province and Dominion believe so also. We are certainly working into the channels that Mr. Pattulo has just suggested. I am satisfied that all the members of the local association in my country have consulted with each other as to the prices at which they would sell honey last year; the consequence was we have a very even market. I think to just keep pegging away honestly is what we need and if we deal honestly we will succeed, and we will get our own people to eat nearly all the honey we can produce, so far.

Mr. Gemmell: I have no objection to offer to Mr. Couse or Mr. Brown's remarks, still I do not think it would do any harm to get up a bee-keepers' exchange. The industry is enlarging to a greater extent, and if we can ship honey to the old country and get a fair price for it it will tend to keep the price up in this country. While I would not like to discourage anything in that line, I might say as for myself I could not probably do as Mr. Couse or somebody else can, sell it in small towns and in the cities; I have to produce the honey and sell it in large quantities; it would not pay me, for I have not got the time to retail it as others have; and there are quite a number of others the same way—Mr. Hall and quite a number of the other producers.

Mr. Craig: The trouble is the low price of honey has not originated with the expert, but, as most of us here know, it is with the small producer who has just a few colonies of bees. Neither can you attribute it, I am sure, to any member of the Ontario Association; it is the people who are outside of the Association and who will not come in. I might suggest that perhaps the Ontario Association might do more by way of getting them interested in the Association and its work, and educating them to the point at which the members are at present.

Now, so far as the British market is concerned, I agree with Mr. Brown and some others who say we may make a great deal more of the home market than we really do. This is true. The trouble in connection with the foreign market is that we have not the regularity of supply. Now, for instance, last year we didn't have enough honey for the Dominion of Canada. No matter how we work up the trade in Great Britain and get our customers there and it comes a year like last year, we have nothing to send them. Perhaps some one may see a way out of the difficulty, but that is how it presents itself to me.

Mr. Dickenson: This is a pretty broad subject. I see there is a difference of opinion with regard to this exchange question, but the way the thing strikes me is we should have an outlet for our surplus honey, especially for the years that we have an extra production. I think that you will all remember when we had an extra production

of honey in this Province, not many years ago—I have a clear recollection of it, and doing my level best to sell that honey in the home market; I do not know that any man can do more than I did. I simply took in all the wholesale men and some retail men. I did not myself go on the market and try to sell it retail, but I tried in the best possible manner to dispose of this honey wholesale. I found at that time that I had a thousand pounds to carry over, after doing my best. We might run into one of those good years again. I have solved the difficulty as far as I am concerned in that respect. I did not hesitate to say if I get that good year again that I am prepared for it. I think there should be an outlet for our surplus when the good year comes, because you will take a low price for your surplus right here in our home market and do your best. When fruit is plentiful you all know that honey in a manner is going to take a second place. I do not say this to discourage you but simply that you must have an outlet for your surplus honey when the time comes to keep your local market in a healthy condition.

Mr. McEvoy: I wish to endorse every word Mr. Dickenson has said. Fruit comes strongly in competition with honey, and the year that there is a large crop it weakens the price of honey and we must have an outlet, so that I think it is necessary to look to outside markets. This year is no rule; honey has sold well, and it is partly the result of the failure of the fruit crop.

A. Laing: Mr. McEvoy just says that this year is no criterion and that honey has sold well all over the Province. I have been informed while here of gentlemen who have sold their honey this year for six cents; I know of one in the County of Halton who had about 10,000 pounds, a man who was supposed to be quite up to date and well informed as to what was going on in the Province; he sold part of it for eight cents when he might just as well have had between nine and ten. Now, my firm impression is simply this, if the bee-keepers were banded together and had some system of reporting from all over the Province as to the amount of honey they had, to some one person, and have a committee or general manager for the Association, that they could sell the honey at a uniform price, and one that would bring much better returns and better satisfaction to the bee-keepers of the Province as a whole.

I am reminded of the Colorado Beekeepers' Exchange. They used to have just the same times there about the indefiniteness of prices that they had in California, and that we are having here in Ontario, but they formed the Bee-keepers' Exchange; some of the buyers went out there and they wanted honey at a certain price, and the manager of the Exchange said, we are setting the price this year, and the price is so and so. The man got exceedingly hot, and, to use a common expression, he nearly tore up his hat, and he declared he would and he could buy it at the price he wanted: the manager told him to go on; and he went on, and he went on for quite a while, and he did not get any honey, and finally he came back and bought of the man at the Exchange. I think what they have done in Colorado we can do in Ontario.

Mr. Brown: I agree in getting an outlet for surplus honey. I know in my district, and I think it is something the same all over, we are never sure of a surplus; we may have it one year, and it is generally one year out of three. Consequently with this big crop it is all right to have an outlet. But supposing we should have to carry some of that over the second year? As a rule there is a failure the second season. I have never got two good crops of honey hand running yet, because the clover is usually killed, as it is killed here, with the heat of the summer or the cold of the winter. With regard to getting a report of the honey produced, in our part of the country, I think taking from Central Ontario to the far east there is more honey by five times, at least, produced outside of the Ontario Bee-keepers' Association than there is produced by them.

Mr. Frith: How does the Colorado Exchange, and how do the Colorado fruit growers get their price?

Mr. Brown: I have not studied that out.

Mr. Pickett: It seems to me it was the surplus honey that brought about the Exchange in Colorado. It is generally the surplus amount that brings about the cure.

I think we are working in a very good direction to get rid of our honey; we are giving it a character and building up a character for ourselves, and that is working a cure, and apparently a very satisfactory cure. As far as I am concerned, I would say send along the honey and we will find a way to get rid of it. In our section of the country I know we could do that well. We could find an outlet for a considerable amount of it at the present time; in fact, many of us are badgered for it all the time, and we can not supply it. In our neighborhood I do not hear any complaints about being overstocked; in fact only once in ten years have I had to carry honey over. I think if we put forth a sufficient effort we could get rid of all that we have; and if we should have a large surplus I think it will naturally cause people to better themselves and create a means for getting rid of their surplus.

Mr. Frith: Are we not sacrificing our prices by disposing of it in our home circles?

Mr. Pickett: I am not sure that you are. I have not sold any in the last ten years for less than ten cents. If there is any sacrifice in that I do not know of it.

Mr. Hall: I wish Mr. Pickett would give us the information so that we could dispose of our crop at that money.

Mr. Pickett: You may live in a section overcrowded with honey and you require an opening, and then if you do require that opening you must look out a little wider; you must not expect to sell 100,000 pounds where there is only 1,000 needed. If you have the honey you will seek to find a place to put it, and in so doing it will protect itself, as it has done in Colorado or California; the Exchange will be formed of a necessity. But as to sending honey to the old country, the market is really not ours; we can not supply it. What is the use bothering with a market we can not supply? We have not got the honey to supply it constantly. Prof. Robertson has been there and given us an evidence of the fact more than once as to the paying prices and the effort required to put it on that market. It is not the quality of the honey; but it is not our market from the fact that it costs too much.

Mr. Roberts: My little experience is I can not get enough to supply the customers. I have had people come to me and pay fifteen cents because my honey was clean and nicely put up, rather than go to another man and pay ten cents. As regards the sale of honey in England, I have sold quite a lot there, and we, in general, got about eight pence a pound (sixteen cents); it is very dark honey. In trying to find out the reason we could not get a better price for our honey, we thought it was because they could buy such immense supplies of this Californian honey at four pence a pound, and that price they were paying for English honey. But it is my opinion there should be a channel for surplus honey, if it is needed. But I think if people get a first-class article here and they put a price on it they can get it.

Mr. Dickenson: With regard to the price of honey in the old country, the supply and demand regulates that. They have got a market there that is open to the world, and it simply comes in there in large quantities, hundreds of kegs. If the supply is great the market is put down, but my experience is that it has been a good price, taking an average of four years; in fact, I do not want any better; that is, in comparison with our retail prices in the four years. I am satisfied, because you get rid of your honey; it goes out of the country; it leaves your local market in as good a condition as possible, and you get your money back; your returns are quick. I do not say that the next four years will be the same, but I do not see why it should not. But I say if the large producers would send out some of their surplus into the old country—you must have a first-class article—I think it will be the better for all the bee-keepers in Ontario.

Mr. Frith: In forming an exchange or combination, there seems to be an idea that we are going to send the honey to the old country. Nothing of the kind. That is not to be inferred. The idea of forming a guild is that we will get a more uniform price. The quicker we take into consideration the propriety of forming an exchange the better for the honey industry of this country.

Mr. Holmes : The line of argument seems to be quite in line with the suggestion, and which I thought a practical one, which I ventured to offer through the Canadian Bee Journal in the early part of the summer. It was this: that some one person in the different districts, either by seeing a number of persons or corresponding with them, secure statistics as to the progress of the work, and send them to the Canadian Bee Journal and have them issued in the form of a bulletin for the Bee-keepers' Association, and that they be furnished to bee-keepers only, and that those be sent around at intervals of say two weeks during the season ; it would be a guide to those who have honey in considerable quantities to sell, that they might know whether the market was full or whether the honey was only a fair crop.

Mr. Couse : Mr. Craig brought up the question of small bee-keepers who do not take an interest in honey producing. I think this past few years they have been pretty well killed out, but I think the easiest way to get rid of those people is to buy them out. I think that can be done to a great extent.

Mr. Sibbald : I have been a close observer of the honey market, and have a good deal of honey sometimes to market myself, and I have been very much interested in the discussion on Mr. Pattullo's remarks, and perhaps I can throw a little light on the honey situation this year. Two years ago honey was a partial failure, or perhaps nearly a failure, in Ontario; some districts had a very good crop, but a good many had not. A few wholesale houses secured this honey early at a low price, and made a large profit on it ; the next year the case was similar, and honey was sold at a low price in comparison with what it brought afterwards. Then the dealers that had to pay this high price began to waken up and they said, we are going out this year to secure our honey early, before the wholesale men get hold of it ; and that is one factor that helped our honey this year. Every dealer wanted to secure his stock of honey ready for the winter supply ; and just at present I may say that there are a good many stocks of honey held in different cities that are not sold and are not consumed yet, and the dealers are just a little dubious whether they will get the price they paid for them or not. And the fruit was another factor that helped prices. Now as to a combination, there is no doubt that the bee-keepers ought to combine and have one or two men or a man in different sections of the Province. Let us be like the butter-makers ; they send their cream now to the factories and have it made up, and one man sells the butter of probably 100 farmers and they secure better prices on the whole ; they make a uniform quality of it ; put it up in uniform shape, and it is all good. As to the cheese, it is something similar ; the milk is all sent to one place and it is manufactured there, and the Association of cheese dealers sell it through one man. We bee-keepers ought not to be behind. Because we have had a good market the last three years is not saying we are going to have it next year or in the future ; and I do not see any reason why we ought not to combine to get those crop reports and set our prices and figure as to how much this Province will require, and then try and find a place somewhere outside of the Province to send the rest to ; and in that way we can keep up the price of the home market, too.

Mr. Gemmell moved, seconded by Mr. A. Laing, that a committee be appointed to take this matter in hand and see what could be done with regard to forming a Bee-keepers' Guild ; and that this committee be composed of the directors of the Ontario Bee-keepers' Association, and Messrs. Hall and Frith.

Mr. Evans moved, seconded by Mr. McEvoy, in amendment, that the committee be composed of Messrs. Gemmell, Frith and Hall. The amendment put and lost, and the original motion put and carried.

EXHIBITS OF HONEY.

By R. H. Smith, St Thomas.

Exhibits of honey at our local fairs and exhibitions have come to be recognized as much a part of agricultural displays as fruits or vegetables, and in any locality where bee-keepers have taken sufficient interest in agricultural societies, and attended their

meetings, the directors have seen to it that the premiums were liberal and encouraging. There is no better means of educating the general public in the nature and use of honey than a good display at fairs. I do not mean such as is usually called for in many prize lists, perhaps, "strained, five pounds," and "in comb, five pounds," which is often taken literally. The liquid is very much strained, but not all of the pollen strained out of it, and as I have seen, large brood combs shown for comb ; all this is pretty good evidence that there was no up-to-date bee-keeper on the committee for revising the prize list.

The Secretary and directors of agricultural societies are generally progressive and intelligent men, who wish to have their exhibition outshine all the others, and to do this they must be well informed, and I have always found them willing to do all possible in the way of allotting space and premiums for displays of honey, especially after it has been shown what an attractive display may be made with honey and other products of the apiary. Of course I do not mean that display should be encouraged before quality ; quality should count most every time.

Some years ago, when living in Muskoka, I exhibited honey at the Muskoka county fair, showing the small quantities called for in the prize list. It was classed with preserves, pickles, and other home produce, and attracted no particular attention. The next year I exhibited at the Industrial at Toronto, and, on my return to Bracebridge, applied for space at the county fair to put up a display of comb honey in sections, also extracted honey, both clover and buckwheat, some of it clear and some in the candied form, several hundred pounds altogether. Well, the result rather astonished me ; I was overwhelmed with questions about honey. "How did I get it into the little boxes?" "How was it some was so light and clear, another kind so dark in color ?" "What made it candy?" etc., etc. People who had never seeen or tasted honey before, stopped to admire, and expressed a desire to purchase some, and the result was that we sold all our cull sections by cutting them into five-cent pièces, that were eaten on the spot, instead of candy, and many who had once tasted honey, purchased some to take home with them. I had a crowd around the exhibit the whole time. The honey was all sold, and orders were taken to be filled later. This proved to be the best advertisement we ever had, and was the means of introducing honey into many homes, where it was found to be so much more healthful and economical than many of the preserves in common use. When on a visit to Muskoka, during the fall of 1900, I found the displays of honey were still kept up ; the bee-keepers in that district, who are as progressive as any in the Province, evidently see that they are represented on the board of their flourishing County Agricultural Society.

A mistake is sometimes made, when attempting to make a display of honey, in not having a sufficient variety of packages. I have known an exhibit to be made of several tons of extracted honey, all put up in sixty pound tins in their cases ; while such an exhibit may be impressive to the amateur who has a few colonies, to my mind it is not as attractive to the general public as a much smaller quantity would be, if put up in a variety of packages of both glass and tin. Another large exhibit I remember was all put up in one-pound glass jars ; in both cases these were extremes, and were rather monotonous to the beholder. It must not be supposed that a good display of honey is made without some work. Honey of good quality is first required, the comb in sections, with its delicate white cappings, must be freed from propolis, and crated in new, clean, no-drip cases, of various sizes, with glass on one or both sides to show the contents. The extracted honey, if in the candied form, will be of the previous season's crop, and put up in glass jars, or, if liquid, it is best to have a variety of packages of both glass and tin, of a size and style that may be useful after the honey is used, with a sprinkling of fancy jars for display only. I find it best to heat all honey, to be shown as liquid, to about 145 degrees, to remove all signs of granulation ; after it is cold it may be run into glass and pails of various sizes, that have been nicely labeled, care being taken not to use jars that have a green tinge, or it will give the honey an unnatural color.

The exhibitor is now ready to set up his display, and in doing this he has to be guided by the quantity to be set up and the space at his disposal. A small exhibit, artistically arranged, is far more attractive than a large quantity massed together without

design. And, last, but not least, if there are many entries, and he is trying to get ahead of his competitors, he must not forget that very likely the other fellow is doing the same.

Mr. Craig : In exhibiting honey, which has been brought before you by Mr. Smith, we sometimes think that this is a matter that is not as much patronized by the bee-keepers as it might be. In exhibiting honey at centres such as Toronto, London or Ottawa, the producer is brought in contact with wholesale buyers, and at the same time he is educating the public as to his product as in perhaps no other way he could. Mr. Smith has very well emphasized the points in connection with exhibiting honey that are well to be paid attention to. In neatness, display, quality and so forth, and the more competition there is at these exhibitions, of course the more anxious the exhibitor will be to have his exhibits in the best possible shape. Now, Toronto of course is the great headquarters for expositions of this sort, and it occurred to me that that exhibition had just got to a point where the Ontario Bee-keepers' Association should take hold of the matter and see that the industry gets the prominence that it should. For instance, this last fall, those of us who attended the exhibition there found the honey exhibit in a tent stuck away in a part of the grounds where you would least expect to find it. It seems that the honey exhibit has to give place there to every little thing that comes along. Some years ago they had the Little World Building, and they occupied for a time a part of the agricultural building, then, after that, they were under the grand stand, and really you never know where you are going to find the honey exhibit when you go to Toronto. Now, I think it is about time that the Association, if we continue the grant to that fair, should see that the exhibitors got fair play.

The discussion was continued by Messrs. Pickett, Evans, Holtermann and McEvoy. It was pointed out by some of the speakers that the defeat of the by-law to enable the directors of the Industrial Exposition to erect new buildings was the chief cause of lack of proper accommodation for the honey display.

Mr. Frith moved, seconded by Mr. A. Laing, "That the grant from this Association to exhibitions shall be on condition that we have a proper and appropriate place for the exhibit, to the satisfaction of the representative appointed." Carried.

QUESTION BOX.

Q.—Is a larger hive than an eight-frame Langstroth desirable ?

Mr. Hall : For what purpose ? I have equal to the eight-frame Langstroth hive, and I have equal to the eleven-frame, and for extracted honey I want the large one, and for comb honey I do not trouble which one it is.

Mr. Holmes : Answer it both ways.

Mr. Hall : For comb honey the smaller one. In the location where you have a fall flow the smaller one every time. In locations where you have nothing but white honey, where it shuts off the 22nd July the large one every time.

Mr. McEvoy : Would not the man have something to do with it ?

Mr. Hall : The man has something to do with all these things. He is the smallest portion of it. The field is first, the man is next, the hive is next.

Mr. Fixter : As far as my little experience is concerned, I have no use whatever for the large hive.

Mr. Hall : But you have no fall flow.

Mr. Fixter : No. We have had the 8-frame Langstroth and a hive 15 x 15 x 20, and a hive 14 x 15 x 12, we have the Hedden hive ; the eight-frame Langstroth hive can knock them all out. That is three years' test.

Mr. Hall : Mine have had 25 years' test.

Mr. Holtermann : We are going to have 250 hives made, and they are going to be 12-frame Langstroths.

Mr. Hall : Mine is equal to a 13-frame Langstroth.

Mr. Holtermann : I agree with Mr. Hall entirely. Mr. Hall says he wants the large hive for extracted honey, and for comb honey he does not care which he has. I do not want to run two kinds of hives if it can be avoided. If you are beginning two sizes of hive, and you can make both do for comb extracted, I do not just see the objection that Mr. Hall has, if you have the fall flow.

Mr. Hall : I will tell you what I do at home. I take every ounce of white honey I can get from the top, and I either fill them up with foundation or put two together and run them down to the fall flow, and they run together and they give me 50 or 60 pounds of a fall flow.

Mr. Holtermann : You can contract through the light flow and then give them more room for the dark.

Mr. Hall : I would rather keep them on the small hive, so that they would not have any surplus honey downstairs, and then give them a chance to fill up with the fall flow.

Mr. Holtermann : You would contract to about eight for winter ?

Mr. Hall : If I am not lazy I would contract to four. Four will hold 35 pounds.

Mr. Gemmell : I have some on four, solid sealed combs now; that is all they have got. I would like to endorse what Mr. Hall says, it is not so much the hive, it is the location and management. If I had a Jones hive I would use them; if I had smaller hives I would utilize them in such a way that I could make them big if I wanted to.

Mr. McEvoy : I think Mr. Gemmell set it right when he said it it was the management, but I would want that management conducted with the 8-frame Langstroth.

Mr. Gemmell : In regard to winter do you mean ?

Mr. McEvoy : No, in wintering the big frame is nowhere. I would want the smaller hive then every time.

Mr. Gemmell : Do like Mr. Hall, contract it if you want to. I want the big hive for summer.

Q.—How close should an apiary be located to a dwelling so as not to cause annoyance to the inmates ?

Mr. Hall : The distance makes no difference. You get a good woman in the kitchen making pear preserves, and you go out and monkey with your bees and I guarantee they will be around the house whether they be five feet or 500 yards. I prefer to have them as close to the house as I can get them, simply because you have not to run so far backwards and forwards, and also in carrying them out and in.

Mr. Gemmell : That will depend on how the house is located, whether there were many trees or few. Our bees are very close to the house; we have a good many trees; they never bother us or the neighbors. If you have an open space around the house the further they are from the house the better, I suppose.

Mr. Sibbald : A great deal depends on the way they are handled, I think.

Mr. Fixter : I think that question is more in relation to people who live adjoining beekeepers; how close they can be set to the neighbor's house so as not to cause annoyance to the neighbor.

Mr. Gemmell : The answer given would cover the ground, it depends on the location.

Mr. Hall : For eight years we kept on an acre lot 250 stocks of bees, and they were within twelve inches of the house and the hives were back and back, and they stood within eight feet of one of the most popular travelled roads in the city of Woodstock, and I have to hear the first complaint on that road about the bees. They simply had to fly over a cedar hedge and that kept them up above the heads of the people.

Mr. Evans : My bees are about ten feet from the rear verandah of the house, but I have a close board fence between them and us; they do not trouble me at all, but my next neighbor is a Methodist parson, a good burly man, bigger than my friend Hall; one day he was out picking raspberries, and he had gold spectacles on, too, and he thought he saw a bee coming and he struck at the bee and he lost his glasses among the raspberry bushes, and he never could find them.

Mr. Gemmell : I lost a pair of glasses the same way. (Laughter.)

Mr. Chalmers : I think there is a good deal in the way they are handled. There is no difference whether there is a board fence or a hedge between them or not; some will handle bees and make them cross, so that they are an annoyance at any distance. I think there is more in that than anything.

Mr. Hall : As most of you know, I have a record of each hive, and wherever there is a cross lot of bees I put a cross on the corner of the hive and that queen is superseded as soon as ever we can do it without losing money. If they swarm she is killed immediately.

Mr. McEvoy : I do not give them them a chance to swarm sometimes ; I just pinch their heads off a little before that.

The President : There is a great deal in handling bees. I mind when I just with Mr. Alpaugh west of St. Thomas, and on the farm next they used to plow and cultivate the corn and come right up to the fence, right close to the bee yard, and they never had once to move their horses out of a row of corn or anything else. And the year after the next gentleman that Mr. Alpaugh got to look after the bees, the owner of the farm told me that often they used to have to unhitch the horses from the binder and draw it away down the lane before they were able to hook the horses to it. He said the bees were so annoyed because of the honey sitting around and the scrapings of combs and one thing and another, they were tired of the bees on the place.

Q.—What temperature is the nearest correct for the cellar wintering of bees ?

Mr. Hall : I like 44 degrees. But I have wintered in a cellar it stood 52 degrees all winter, and I wish I had the privilege of wintering in that cellar now. It was a very awkward place to get in, and we packed them in as close as you can pack up cordwood or bricks, and we did not raise up from the bottom board, but when we took them out they were all right.

Mr. Gemmell : I should suppose it would require different temperatures in different cellars.

Mr. Hall : This was a very dry cellar and well ventilated; it was a board cellar; under the house there was no stone foundation, and when you were down in the cellar you could see light coming through the cracks.

Mr. Holmes : What preparation had you on top of the hives ?

Mr. Hall : None at all; if they stood out in the row with a cloth on top of them they went in with that; if they stood with a honey board on them they went in with a honey board.

Mr. Holmes : You do not advocate cushions or any absorbent ?

Mr. Hall : I do not. I have got some honey boards with glass in them and that glass, if it is exposed, collects moisture and it drops on the bees. We use sometimes a piece of cloth to prevent the air coming in contact with the glass.

Mr. Dickenson : I say 44 degrees is a very nice temperature. I think 44 degrees would be as low as I would like to go; I think they would be likely to keep quiet in that.

Mr. Sibbald : I have an idea that shortly after they are put in they can stand a lower temperature than they ought to be exposed to later on towards spring. I do not close my cellar up very tightly. As near as I can tell, when I left the temperature was 40 degrees and I expect it will be somewhere about 44 degrees when the door and the cover over the floor is closed.

Mr. Holmes : Mr. Hall has told us that 44 degrees is the nearest to the correct thing, and that he would love to winter in a cellar of 52 degrees, so I suppose that would mean 48 degrees.

Mr. Hall : No, sir. I couldn't help myself. It ran up to 52. The bees came out as I tell you like the front of a cow's head; and they wouldn't fly either; they were sleepy and nice.

Mr. Frith : 44 to 54 degrees, but it must be constant, must not change suddenly from one temperature to another.

Mr. Smith : I find that they winter best in a temperature of from 44 degrees to 50 degrees.

Mr. Pettit: I think it seems to depend a great deal on the cellar.

Q.—If bees hang outside of the hive does it indicate no honey flow or is something wrong with the bees? What is best to be done?

Mr. Hall: If they were strong and no honey coming in they would stay at home, and they would melt down if they stayed inside, and they would have to come out on the shady side of the hive.

Mr. Gemmell: If there was lots of honey coming in and they were loafing around the outside it might show they were attempting to swarm.

Mr. Hall: If they are loafing around on the honey board when the others are working—perhaps two or three dozen—it tells you there is no queen.

Mr. Fixter: What would you advise to do?

Mr. Hall: If there was no honey coming in I would advise you to let them alone, and if there was honey coming in I would advise you to divide them. If they were fooling around and had no queen I would advise you to destroy them and not give them a queen.

Mr. Roberts: Would a lot of bees hanging out like that, and being pretty full inside, indicate too much heat? Would they need ventilation?

Mr. Gemmell: They might.

Mr. Pickett: I think they often hang out in the summer season that way when the hive is filled with sealed honey. You don't find them hanging out very much if it is unsealed.

Mr. Hall: They don't want to melt it down.

Q.—What is to be done with the queenless colony early in the spring?

Mr. Hall: If it has lots of honey I would simply pick it up and put it on top of one that had a queen and not much honey. If I had not one in the condition that it had not much honey I would simply shake off the queenless bees and preserve the comb and honey and hive for some future use. Beginners always fancy they must introduce a queen as soon as they find that a colony is without a mother. They are just wasting their time and money as a rule. I used to be bothering with these sort of things, but I have not done so these last twelve or fourteen years.

Mr. Dickenson: I quite agree with Mr. Hall; that is my experience exactly. It does not pay to try to introduce a queen to a colony that you discover is queenless in the spring.

Mr. Gemmell: I never bother with them myself except to treat them as Mr. Hall has done.

Q.—What is the best way to put up extracted honey for retail trade?

Mr. Hall: Pound jars, perfectly round, made in Hamilton; white glass pound jars; one and one-half, three pounds. Stop at that for the retail trade.

Mr. Evans: I do not know whether the question applies to retailing through dealers or retailing to your neighbors at home; that would make a very great difference to me. I do not like to have a smaller package at home than ten pounds when a man comes for honey.

Mr. Hall: The larger the package the better, but you have to put it up to suit the retailers. If they want tumblers you have to give them tumblers.

Mr. Couse: Would you put up a thousand pounds of honey in half-pound jars to a grocer and charge the same price as if you were doing it up in 10-pound lots?

Mr. Hall: If I have the time. This time of the year I will fill up anything they choose; I have lots of time.

Mr. Dickenson: I find you can educate the consumers along that line to take honey in larger quantities. I supplied one man with a 25-pound tin simply because I had no other vessels to put it in. He sold all that honey to customers. He said he had no trouble at all. I advocate a 25-pound tin.

Mr. Hall: At the house we find a 10-pound tin is the best we can get. We sell three 10 to one 5, and four 10-pound tins to one 20.

Mr. Smith: I find it depends largely on the class of trade. Farmers in our district will take 20 to 60 pounds usually, but the railway men as the majority of the

people are in our city, will buy smaller quantities. We find it is advisable to put it up in any shape they require, from a ten-cent tumbler to five-pound cans, and that is the size mostly in demand in our city.

Mr. Hall: At home we never sell anything less than 25 cents worth. If they do not want that they can go to the grocery and get it. They fetch their own vessels, and we would just as soon they would.

Mr. Sibbald: There are six half-pound jars to every pound jar sold in Toronto; that is a ten-cent jar.

Mr. Hall: The larger the city the smaller the package.

Mr. Holtermann: It is largely what the people are educated to. Years ago in Toronto as you know it was quite an ordinary thing to sell the 5 and 10 and 25 pound lots, and then the late Mr. Spence came in there and did up these small packages, and I consider it was a great injury to beekeeping to do that, and Toronto has got used to small packages. If they had been educated all along to take the larger packages they would have bought them and it would have been at more profit and advantage to the beekeepers.

I think that is a lesson that people in their own localities can remember and think of when they are trying to educate the people to eat honey.

Mr. Gemmell: Do not you think if Mr. Spence had not put up those small packages that hundreds in the city that eat honey now would never have eaten it at all; and do not you think those that got 10 and 25 pound tins have got kind of tired of it?

Mr. Holtermann: I have no doubt that more people have eaten honey or have tasted honey, but as I see it, that is not what the beekeeper is interested in. He is interested in marketing the quickest and most readily his product. If he wants to do that he will never educate the public to use a small package.

Mr. Sibbald: There are a great many people in Toronto who have so much a week to live on; they live so much from hand to mouth, and they cannot buy a large package. In regard to what Mr. Gemmell says, I think he is right; I think there are lots of people who would never know the taste of honey if they could not buy 10 or 15 cents worth; they could not go up to 50 cents. You would be surprised if you were in the small retail stores to see the small quantities that people buy; two or three cents worth of comb honey, or something like that, in a little box, and there seems to be a demand for it.

Mr. Hall: They are coming down to the small things even in the city of Woodstock.

Mr. Couse: Whose fault is that?

Mr. Hall: It is the fault of the supplier.

Mr. McEvoy: In the city the retail trade, some of them, do not like to pour out the honey, weigh a little and empty part of it back, but if they have got small glasses and the customer sees a little jar there for a trifle, he buys it, and the storekeeper does not have to do any weighing, and the customer can put it in the basket and take it away; and he will sell many of them, and it is a good way to get rid of it in the retail trade.

Mr. Holtermann: I still believe it lies largely with the beekeeper and the men who sell the honey as to the quantity a consumer takes.

Mr. Darling: There are two sides to that question. I have occasionally run across people who wanted to buy a large quantity, and I thought a larger quantity than was profitable even to themselves or myself. I do not believe in putting so much honey in a man's hand that they leave a few pounds in the bottom of a jar to granulate, and leave it there till that is done. I have come across that difficulty once or twice, and I have found out it is the safest plan not to give a person too much if they want a great lot of it. If they only want a little bit it is no harm to urge them to take more.

Mr. Craig: Everyone will have to put it up in such packages as his local trade demands, and the small packages have come to stay, whether in honey or any other commodity; we all see that in the local stores, whether sweets, food or corn starch

or whatever it is, the grocer introduces these and it is handy and easily turned over, and there is no soiling of the fingers or washing of the hands over the thing, and so the grocer believes it is to his advantage in that way to sell the package, and no weighing, and so on; but so far as the producer is concerned he will have to regulate himself according to his local conditions.

Q.—Is it wise to sell off culled honey at the Exhibition, where people are to be educated as to quality and prices ?

Mr. Hall : Any seller that has been to the exhibition does not need to have any answer. That is about the only thing that took me to exhibitions, to sell culled honey, when I could go and take $45 in five cent pieces.

Mr. Chrysler : Does not that question refer to the poor quality of honey ?

Mr. Hall : In those days we had no poor honey. The honey was unripe that we took down, but when they bought 5 cents worth of honey they had it. When I had 600 or 700 pounds of culled honey it was just the nicest thing to do down to Toronto to sell it. It was a pleasure to me to sell it, because I did not want it.

Mr. Sibbald : It may pay the beekeeper, but it sets a standard price for a section of honey, and people who do not know as much about honey as we do think the sections are all the same. They will say, why, I bought a section at the Exhibition for 10 cents, and the storekeeper was probably asking them 15 or 20 cents for a full section. They do not understand the difference; and then because they can't buy it as cheap as they bought it at the Exhibition they will do without it.

Mr. Holtermann : Does not Mr. Sibbald think that men know well enough the difference between the two sections only they have got a good talking point in buying honey from Mr. Sibbald ?

Mr. Sibbald : I do not mean the buyers, but people who are in the store.

The President : I know there are lots of people who think that all honey is honey; a section of honey is a section of honey the world over.

Mr. Holtermann : If you were down at the Toronto Exhibition you would know they were smart enough to pick out a full section every time.

Q.—Does it or does it not hurt the sale of honey ?

Mr. Hall : I cannot answer that. I am a beekeeper.

Mr. Smith : I think that might be qualified in this way, that if the culled section was good quality the people would be so well pleased that they would be very apt to take some more home.

Mr. Hall : I think that is right.

Q.—Will crossing Carniolans with Italians produce cross bees ?

Mr. Hall : Yes and no. You will find cross bees of all crosses. Those of you who have handled Carniolans and those who say they are the quietest bees in the world do not know what they are talking about. I have had bees in the town of Woodstock that were not worth a cent to keep, but you could not make them sting, and the best bees in the world, if you gave them honey gathered by the other bees. What those crosses were I do not know. I think it was about 20 years since we had them, and we have not got rid of the blood yet.

Mr. Gemmell : I can endorse what Mr. Hall says in regard to the crossing of two races; sometimes you get very quiet bees and other times you get very cross ones.

Mr. Hall : You simply have to cull out and keep culling out your cross ones. That is one great reason why I keep them on the same stand from year to year, you know the characteristics of the bees; have your record on the hive and mark it across, and that means it is to die.

Q.—Give us the most profitable method of getting foundation made into comb ?

Mr. Hall : That is a little ambiguous. If you mean the quickest way I could answer that pretty quickly. The most profitable way is to give it them when they are gathering honey pretty fast, so that they will pull out the whole thing in twenty-four hours. I find if you give it them late in the fall they pull out a part of it, and they each have the bottom part of the foundation to cap. That is not profitable; there is a place at the bottom they can build drone comb.

Mr. McEvoy: I suppose Mr. Hall knows as well as I do that it is not profitable to hive swarms on foundation.

Mr. Hall: If you do not want to hive them a second or third time it is not. If you want to take comb honey you are losing money, but if you wanted to take extracted honey do it every time.

Q.—Which is the best race of bees?

Mr. Hall: All of them. I have not a pure bred bee in my apiaries, and do not want them. There is no best cow, no best horse, no best woman. (Laughter.) You may have got your fancy, but that will not make it the best.

Mr. Smith: Judging from the advertisements in the different bee papers you would suppose the long-tongued bees are the best. I may say I got some of the famour long-tongued bees, and we measured the tongues, and we also measured some of the tongues of our own, and I could not find any difference. And as far as honey gathering qualities went, I found out our own hybrid did about as much as the much-advertised long-tongued bees. Some of our own gave us as much as 240 pounds of light honey surplus, and I could not find any of the long-tongued ones that did nearly as well.

The President: I was speaking to Mr. Hershiser, and he had also received some long-tongued bees, and they were working side by side with some hybrid bees; he said the hybrid bees were far ahead, as far as surplus was concerned, of the long-tongued bees. He had sent them away to have the tongues measured, and the black or hybrid bees had far longer tongues than the supposed long-tongued bees which they were advertising and selling.

Mr. Hall: I think nine-tenths of the advertisements are false.

Mr. Gemmell: I would like to have an idea of when the first Italian blood was brought into Canada? Is there any record of it at all?

Mr. Hall: He knows he is the first man that brought one in.

Mr. Gemmell: No, I do not. I brought it in in 1864; if there is any ahead of that I would like to know it.

Mr. Couse: Mr. Gemmell had one of them.

Mr. Holtermann: Before closing this question in regard to the variety of bee, I believe it is an important one, and I had hoped to hear something more brought out on that. I understood the bees that Mr. Hall imported at that time were Carniolans. I believe it was last year or the previous year, in the summer or on there, my name was brought out in connection with the Carniolan bees, especially by Mr. Post, and it was stated that I had got them from a certain source. Though I may say that was not the source from which they were got, I have yet to see a Carniolan bee that is cross.

Mr. Hall: I have not had them cross, but I like them cross-bred. The Carniolan bee is very pretty and very gentle, but I like to have a little yellow blood in first for her ladyship. The most profitable bees I have ever had is the cross between the Italians and Carniolans; I do not know that is the reason they were the best; I can tell you just from the point of honey gatherers they were the best I ever had. I was the first man in Canada, or Ontario, that had a Carniolan queen; that was shipped to me by a lady, Mrs. Benton. This queen only lived with me about four weeks, and we raised from 50 to 60 daughters from her; I never had such bees for producing a large quantity of honey.

Mr. Holtermann: I agree entirely with Mr. Hall, and I believe that it is a very important point; I believe the best strain of bees we can get is the cross between the Carniolan and Italian. That does not mean any Italian or any Carniolan, but it means a proper selection of the two. That, as Mr. Hall says, is the best bee we can get for all purposes, comb or extracted honey. I do not want the pure Carniolan.

Mr. Hall: I do not want any bees pure.

EXPERIMENTS WITH UNCAPPED, PARTIALLY CAPPED AND FULLY CAPPED HONEY.

By Frank T. Shutt, M.A., Chemist Dominion Experimental Farms, Ottawa.

Many of you, no doubt, will remember when I was present at a Convention of this Association some few years ago presenting the results of a series of experiments we conducted at the Experimental Farm in connection with foundation comb, that subsequent to that paper there came up in the general discussion the question of adulteration and the probable appearance upon the market of honey in an unripe condition. I was naturally asked whether unripe honey could be distinguished chemically from ripe honey, it being the general supposition that they differed from one another merely in the presence of a larger percentage of water in the unripe honey. I said at that time that I was not in a position to state what was the normal amount of water as found in the genuine matured honey; I said we had no Canadian data on the subject, and as far as I was aware the European authorities differed widely, for I found some authorities stated 10 and 15 per cent. of water, whereas I found other chemists reported as much as 25 and 30 per cent. of water, and then, on the other hand, there were those who endeavored to bring together the two statements, and said the proportion of water in honey might vary very largely, and that we should not be surprised at finding a variation of as much as 10 and 15 per cent. That statement I made on that occasion. I said that as far as the adulteration of honey was concerned it was a matter outside of my province, and I made the suggestion that if it were thought by the members of this Association that there was any quantity of honey which was not genuine matured honey upon the market, the question should be referred to the Inland Revenue Department, another branch of the Government service, and that I had no doubt samples would be secured and analyses conducted upon those samples. That suggestion was acted upon, and the Inland Revenue Department made a very wide collection of samples, 180 in all, of which analyses were made by the various public analysts throughout Canada, and the results were published shortly after in a bulletin issued by that branch of the Government service. I shall have occasion later on to refer to the results in that bulletin. However, I said also at that meeting that as far as I was concerned, I felt it was quite within my province, and I was quite willing to undertake the work, to ascertain, if possible, the normal percentage of water present in honey, provided some members of this Association would undertake to furnish us with undoubtedly genuine samples. That offer has held good ever since that time, but I have here to state to-day that those samples have not been forthcoming, and the work upon which we have been engaged during the past few months has been upon samples that have been produced upon the Experimental Farm.

When your Secretary wrote me at the latter end of September, asking me to address this Convention, I thought at the time that I had no special work which would be of interest to you, not having undertaken any work in connection with the chemistry of honey; consequently I somewhat demurred, but on talking over the matter with my colleague Mr. Fixter, who has the management of the apiary upon the Experimental Farm, I found that he had conducted a very valuable experiment during the summer and that he had samples of honey which would be available to me for the purpose of determining the water in ripe and unripe honey. I shall tell you more particularly of the character of these experiments and of the nature of the honey resulting therefrom in a few minutes.

These are the samples then upon which we have done the work in the laboratory since the 1st of October, and a very large amount of chemical work, by myself and assistants, has been done. However, I must make this statement at the outset so that there may be no misunderstanding; that I am not able to tell you to-day what is the normal percentage of water in genuine honey, either ripe or unripe. We have done, as I have said, an exceedingly large amount of most careful, thorough chemical work since the first of Oc-

tober, but still we are not in a position to say really what the percentage of water is. Now the reasons for that I will explain to you as I give these results. You will see it has not been a matter of negligence at all, but the question involved is one relating to the accuracy of the process now in vogue. In fact, I have to make some rather astounding statements to-day, and clear the way for future and more successful work, I hope.

To a clearer understanding of the question I think we might very profitably spend five or ten minutes in the consideration of the nature or composition generally of honey, because it is in connection with that phase of the subject that the great difficulty in the analysis of honey has presented itself.

First of all, I suppose we are fairly well satisfied that honey is not a material simply collected by the bees. Of course, I know nothing personally of the matter, not having conducted any experiments, but I find that the concensus of opinion amongst the best authorities is that the honey is in a sense manufactured by the bees; the nectar is col ected and this in passing through the bees is acted upon by a certain secretion, and in that way its composition altered from what it was as nectar in the plants. This will be very easily understood when you think of our own digestive action. . You know that as food passes through the mouth it is mixed with the saliva. There is in the saliva a chemical substance, ferment or diastase known as ptyalin, which acts upon the starch of the bread or the starch of the potato we may be eating and converts it into sugar, and that sugar then is assimilable and passes into the blood. If it were not for that saliva and the principle it contains our starchy foods would be in a large measure indigested and therefore unassimilable. Just in a similar way the saliva of the bee acts upon the nectar they collect and converts its sugar into two very closely allied sugars.

Now I must introduce just a little bit of chemistry, but it shall not be any more technical than I can possibly help. I want to tell you in the first place that there are in chemistry many kinds of alcohol closely related, first cousins and second cousins and so on. Similarly there are many kinds of sugars; there are some of them half-brothers, and some first cousins and so on, so that when we speak of sugars chemically we may include a great family of closely related substances, but not absolutely identical in character. This fact you must bear in mind when thinking of the composition of honey. Let us consider first the ordinary sugar which we use upon the table; that is known chemically as sucrose, it is generally called cane sugar; it is the same material whether we obtain it from the cane or from the sugar beet. If we take starch, which is a sort of second cousin to sugar, and treat it with acid we convert it into a kind of sugar, but it is not cane sugar; it is nevertheless a sugar—and is known as glucose. Now, we suppose that sugar in the nectar is in the form of cane sugar, and the saliva of the bees converts it into a sort of glucose, which, on further examination, proves to consist of two closely allied sugars, dextrose and levulose. It is very doubtful to me if there is really any cane sugar in honey at all. There might be under certain circumstances a small proportion, but the sugars in honey are rather allied to the sugar from starch.

I must go one step further, if you will bear with me. How do we distinguish chemically between these sugars ? We have various methods, one of which is the action of the sugar upon a certain kind of light which we call polarized light. With a certain sugar placed in the instrument designed and constructed for the purpose, the ray of polarized light is turned to the right, and with another sugar, which chemically is closely allied to the first, the ray of polarized light is turned to the left. In honey we find a mixture of both those kinds of sugar. Now it will help your memory if you think of dextrose as right-handed sugar and of levulose as left-handed; in honey we have both dextrose or right-handed sugar and levulose or left-handed sugar, and it has been found that these exist in about equal proportion .

Let me read you a brief extract of the composition of honey, having said so much, from an English authority of high reputation. He says : "Chemically, honey is essentially a concentrated aqueous solution of certain sugars, dextrose and levulose being the most important constituents. Occasionally a small percentage of sucrose ap-

pears to be normally present, especially in the new honey from bees fed on cane sugar, but after a time this constituent undergoes inversion." According to James Bell (who was the chief analyst of the Inland Revenue Department of the English Government), honey contains from 5 to 10 per cent of a substance which undergoes conversion to glucose only by prolonged treatment with acid (maltose, gallisin ?).

"Soubeiran and Dubrunfault also state that honey contains certain undefined sugars, and the same conclusion is deducible from the analytical results of other observers.

"Besides the true sugars, honey contains a sensible quantity of the saccharoid mannite, which may be isolated by fermenting a solution of the honey with excess of yeast, filtering, evaporating the filtrate to a low bulk, adding excess of boiling alcohol, evaporating the filtered liquid to dryness, extracting the residue with boiling alcohol, concentrating the resultant solution, and precipitating the mannite therefrom by addition of ether."

"The other constituents of honey are water, small quantities of wax, pollen, mineral matter, traces of flavoring and butter substances, organic acid, etc. Formic acid appears usually to be present in honey." The foregoing is an epitome of the results of these chemists. Then this authority goes on to give the results, on the average, as obtained by various chemists in England and upon the continent. I shall read to you a few of those results. One authority, J. C. Brown, gives dextrose as 31.77 to 42.02 per cent., and levulose 33.56 to 40.43 per cent. Another authority gives dextrose 22.23 to 44.71, levulose 32.15 to 46.89, water 16.28 to 24.95 per cent. On looking over those results carefully the feature most noticeable appears to be the great variation in the analyses of honey. I say "appears to be" because I can scarcely believe there is such a great variation, but nevertheless the results on record would give that indication, viz., that there is great variation. After adding up all the materials that have been determined and substracting from 100 we have undetermined matter, one authority states it may be from 4.95 to 11.00 per cent; another from 1.29 to 8.82 per cent.; another 8.48 to 19.17 per cent.; another 7.67 to 10.79 per cent.

All these analyses have been made by men of reputation, men endowed with skill and with honesty, but the difficulty has been in connection with the material itself and the process of analysis employed. And now I think I can tell you the reason for this apparent discrepancy. We understand that the two principal sugars of honey are dextrose and levulose. Let us consider their properties. Dextrose crystallizes; it is the material which you see in candied honey. Levulose, on the other hand, does not crystallize; it assumes the form of a thick syrup; it is the sweetest constituent of honey, it is much sweeter than dextrose; further, we find by experiment and analysis that in the artificial drying of honey it is extremely subject to decomposition. Consequently, by the ordinary and usual method of analysis employed, as I hope to show you, decomposition of levulose takes places and its disappearance has been recorded by the analyst as water. Now in order to allow you to intelligently follow me, let me give you a brief idea of how the water in honey has been usually estimated. You see this little glass tube I have in my hand; it contains asbestos, known commonly as mineral wool and used for packing. Mineral wool is absorbent in its character and will hold water or other fluid like a sponge. What we do is this: The tube containing the fibre is thoroughly dried in a water oven, that is an oven kept at the temperature of boiling water, and then weighed; then we pour upon it a weighed quantity of honey, which in order to be thoroughly absorbed by the mineral wool is first diluted with water. Now what do we know ? We know the weight of the tube and fibre plus honey. We know exactly how much honey is in the tube. The tube is then replaced in this water oven and dried for a certain length of time. What takes place ? Water disappears. The tube with contents is weighed carefully back on the chemical balance and the weight over and above that of the tube and fibre will be that of the dry matter in the honey. If we subtract the dry matter from the amount of honey taken we have the amount of water that has been driven off. That is the way in which the water has been estimated by the public analysts

whose results appear in the bulletin of the Inland Revenue. It is the most common method employed. We have given the method an exhaustive trial in our laboratories, and found it faulty, owing to decomposition of the levulose. The longer the honey is dried in the water oven the greater the loss from this cause and hence the larger percentage of water (apparently) shown.

The samples of honey that we have been at work upon were, as I have said, obtained as a result of an experiment instituted to ascertain the differences in quality between honey which had been taken from the comb before capping, taken while being capped, or as we have termed it half-capped, and that which remained in the hive until the comb had been fully capped. We have supposed the honey from the uncapped comb to be in an unripe condition, that which was half-capped has been considered as approaching maturity or ripeness, and that left until the bees had entirely capped it, as ripe or matured honey.

The experiment included other features beside the foregoing. One was to ascertain what difference as regards ripeness and quality would result by keeping the honey in glass-stoppered bottles as against keeping the honey in bottles covered merely by two layers of cheese cloth. Such were the conditions under which we kept uncapped, half-capped, whole-capped honey. Another feature of the experiment was keeping honey in the honey room (upstairs) as against preserving it in the cellar. So that we have had in the honey room and in the cellar samples of each of these honeys kept in glass-stoppered bottles and in cheese cloth covered bottles. Those twelve samples you see before you are the honeys I have been speaking of and which we have analysed.

First of all, my endeavor was to find out if uncapped or partially capped honeys contained more water than the fully capped honey, and also if the cheese cloth covered honey was thicker and contained less water than that which had been kept in glass-stoppered bottles.

Mr. McEvoy: Did you test the specific gravity?

Mr. Shutt: Yes. The point which we have to consider of the greatest importance this morning from a chemical standpoint is the readiness with which levulose breaks up or decomposes when honey is subjected to heat. I do not mean heat such as you would think of in connection with a stove; I refer to a temperature below that of boiling water, because if you remember, this tube containing the honey solution is never subjected in the drying process to a temperature greater than that of boiling water. But we have ascertained from our experiments that we cannot estimate accurately the amount of water in honey, because the levulose breaks up while the honey is being dried. You have heard of caramel: you know what it is; when sugar is browned it denotes that a certain decomposition has taken place; the sugar has been partly carbonized and the result is called caramel. If you were to take honey in such a tube as I have spoken of and shown you, and place it for 24 hours in the water oven you would find the honey had turned brown. Then if you poured water on this tube a thin and extremely brown fluid, quite unlike honey, would be obtained, showing that caramelization has taken place. When sugar caramelizes it loses weight, it is really subjected to a proces of slow combustion. Now, my contention is this, that what we have been supposing to be water and water only as passing off in the drying process is really in part the decomposed products of the honey. The longer you heat it and the higher the temperature the greater the amount of carmelization, decomposition, or, in other words, loss. We estimate the water by the loss in drying, and if part of that loss is due to the decomposition of levulose we get too high a result for moisture.

The longer the honey tube is in the drying oven the greater the loss—and the higher the percentage of water—apparently. If there were no decomposition we should be able to dry to a constant weight, but this we find impossible. This in my opinion furnishes the explanation of the results as they appear in this bulletin of the Inland Revenue. Some analysts have dried for 24 and some for 48 hours, and some have been attempting by still longer drying to get a constant weight. If there were no

decomposition a constant weight should be obtainable. But the fact of the matter is that our experiments show one can go on drying these tubes for several days and they still lose weight. Day by day for a week we weighed those tubes and put them back in the water oven and there was always a loss. From the first weighings we calculated the percentage of water and got numbers in the neighborhood of 14, 15, 16, after twelve hours more we obtained about 18 and then another 12 hours gave us from 20 to 25 per cent., and then, continuing, the percentages of loss went up to 28, 30 and 32. Evidently there was no stopping-place, and what we were calculating as water was really in large part due to the decomposition of the honey.

Now, in order to corroborate what I have said with regard to this question I will give you very briefly some of the results of the various analysts as they appear in this bulletin: The analyst for Halifax examined 24 samples of honey, and he returns every-one of those honeys as genuine. His percentages of water are in the neighborhood of 17 and 18 per cent. An average of them all I find gives approximately 18 per cent. of water. Why are his results all so concordant among themselves? Evidently because he dried all these honeys for the same length of time and he consequently obtained results which are very concordant. According to this analyst we might expect to find about 18 per cent. of water in genuine honey.

Now I turn to the analyst's results for St. John, N.B., and I find he has examined twenty-one samples. He obtains somewhat lower percentages. His results are generally from 14 to 18 per cent. of water, and an average of them all gives, approximately, 15 per cent. of water in the genuine honeys.

But there are still greater differences to come. Let us turn to the results of the analyst for Quebec and we shall find a different set of figures. He obtained data showing percentages of water from 21 to 33, and giving an average that is about 27 per cent.

Mr. Gemmell: Are they all treated the same length of time in the water oven?

Mr. Shutt: That is just it. They are not. The various analysts evidently dry the honey varying lengths of time. The method employed gives results according to the length of time the tube is in the drying bath, and, further, we cannot say what is the correct time of drying. I am of the opinion that decomposition begins before all the water has been driven off. We have here a number of analysts at work and 180 samples examined; they obtained results varying from 15 per cent. to 30 per cent. of water in what is termed genuine samples. Is this really the case? My contention that this is purely a question of analytical method is borne out by the fact that each analyst's results are closely concordant among themselves, and these differences only appear between the work of the different analysts. I will just give you the average amount as found by one or two of the other chemists. The analyst at Montreal gets about 22 per cent. of water. His results are as a rule between 20 and 24 per cent. He obtained about 4 per cent. less water than the analyst in Quebec.

Mr. Hall: He is very even.

Mr. Shutt: Yes. If we use the same amount of honey and dry for the same length of time at the same temperature we get uniform results, but not necessarily true results. The analyst from the Ottawa district obtained about 26 per cent. of water. The analyst for Toronto obtained from 13 to 16 per cent. of water, all from genuine honeys. Evidently he did not dry as long as those analysts that got larger percentages. The official analyst of London obtains results varying from 24 to 32 per cent. water; practically twice the amount of water in honey at London than obtained in Toronto district. Such surely is not the case. The analyst in Winnipeg gets results very similar to those of the Toronto analyst. His results are in the neighborhood of 16 per cent. I am inclined to think—I am not going to state anything as a fact—that the percentage of water in matured honey is much nearer 15 that it is 30 per cent.

Now, for some of our own results: These honeys, samples of which you see here, were analyzed in the method I have described to you. Twenty-four hours drying gave us results between 28 and 32 per cent. of water. These seemed a little high, but

still there was good authority to say that we might expect as much as 35 per cent. So we put the tubes back again in the water oven; the next day we weighed those tubes and found they had lost about 2 per cent. more water. Further drying for twelve hours resulted in a further loss, and so on. They kept constantly losing. The longer the drying the larger the apparent per cent. of water. They might have been going on till now, and they would not have lost all the water they apparently contained. So we came to the conclusion, which I have stated to-day, that the method of drying at the temperature of boiling water was not of much value. Any percentage of water you pleased could be obtained if you only knew just how long to dry the tubes. The chemistry of levulose states that it is a substance which is extremely susceptible to decomposition at comparatively speaking low temperatures. 100 degrees centigrade is the temperature of boiling water, and there is no doubt about the very ready decomposition of levulose at that temperature. But even at the temperature of 70 degrees levulose begins to decompose. We took a second series of honey samples, and we dried them as near as we could at 70 degrees centigrade. What did we obtain? Instead of 29 and 28 we got 21 and 21 per cent. water; instead of 30 and 33 we obtained 23 and 25; instead of 24 and 26 we get 20 and 19; instead of 28 and 32 we get 22 and 21, and so on.

It is evident therefore that at the temperature of 70 degrees one obtains from 8 to 9 per cent. less water than by the method in which the tubes are dried at the temperature of boiling water. From the work of the last two months I am convinced that any method which involves the drying of honey at the temperature of boiling water is unreliable and the results inaccurate. Now, I am not prepared to say to-day that the results from this second series of experiments, drying at a temperature of 70 degrees centigrade, are absolutely accurate, but I will say this that I feel convinced they are much nearer the truth than those which you find ordinarily on record, and those which we obtained by the method which has been in common use up to this time.

There is another method of obtaining the amount of water in honey. It is one which is used by the sugar manufacturers largely. By taking the specific gravity of a sugar solution one can calculate the amount of dry matter present and of course by subtracting the dry matter from 100 you obtain the percentage of water. We tried that method; we took the specific gravity of the honey and we made a calculation and estimated in that way the amount of water present.

Instead of having 21 per cent. of water as determined at 70 degrees centigrade, I get by the specific gravity method results from 15 to 17 per cent., a still smaller quantity than when the honey is dried at a temperature of 70 degrees, which is therefore evidently too high for levulose. If our results obtained by the specific gravity method are correct, then we must conclude that 70 degrees is too high a temperature. I think it more than probable that the levulose in honey decomposes below 70 degrees. If the method by specific gravity is strictly applicable, then the results obtained at this temperature are evidently too high.

I will read you a few more results for the sake of comparison : The percentage of moisture obtained on a sample of honey dried at 70 degrees centigrade was 23; by the specific gravity method we obtained 19 per cent.; another sample by drying, 20 per cent.; by specific gravity, 15 per cent.; a third, by drying, 22 per cent.; by specific gravity, 13 per cent; a fourth, by drying, 26 per cent.; specific gravity, 21 per cent.; a fifth, by drying, 21; specific gravity, 15 per cent. We seem to get about 5 per cent. less water in honey by the specific gravity method than when drying at 70 degrees.

I am not prepared to say to-day definitely which one of those two is the more correct. Probably neither of them is strictly speaking accurate, but I think the specific gravity method gives results nearer the truth. There are reasons which I need not on this occasion enter upon that lead one to think the specific gravity method does not give the exact percentage of solid matter in the honey, but I believe it will be found on further investigation to be much more reliable than the drying method. We shall examine this method more fully as time permits. We also purpose next year to institute a series of experiments drying at still lower temperature than 70, and us-

ing a vaccum. It may be a lengthy piece of work, but we shall have achieved something in Canada if, through the instrumentality of this Association, we can show that the results as recorded for the percentage of water in Canadian honey are inaccurate, and that we have been able to find out something of a definite character with regard to the normal content of water in honey. It is a question of scientific interest, but it is more than that—it is a question of some commercial importance. Because if there are differences in water contents of ripe and unripe honey, if it is desirable that only ripe honey should be placed upon the market, then it is absolutely necessary we should have some means for determining what is ripe and what is unripe honey; in other words, a means of accurately estimating water in this material.

I trust I have made clear the reason for the statements I have made with regard to the unreliability of this drying process, of the results on record, and the necessity for future work towards perfecting an analytical method. In order to see if our assumption regarding the decomposition of levulose were correct, I made artificial honey. You remember that honey consists essentially of the two sugars, dextrose and levulose; so we obtained chemically pure dextrose and levulose and mixed them in equal proportions and then analyzed the mixture by these two methods, the specific gravity and the crysotile or asbestos fibre method, and with the latter drying at the temperature of boiling water and at the temperature of 70 degrees centigrade. By the specific gravity method we got the results expected; that is to say, there was a return for all the dextrose and levulose in the solution. It is thus evident that if honey were a mixture of dextrose and levulose only then reliable results as to percentage of water present would be obtained by the specific gravity method. I am very hopeful of this method, and think it very probable that further research will show us how it can be used to obtain correct results. However, with our artificial honey it worked very satisfactorily, and this was encouraging. Then we started with our asbestos tubes just in the same way as we had done with the honey. What was the result of drying at the temperature of boiling water in the water oven for 24 hours? We found that there was a loss of 10 per cent. of the sugars, due to decomposition of the levulose. If we had been working on honey that loss would have been put down to water. But I knew exactly the amount of levulose and dextrose I had in that tube, and 10 per cent. of that weight was gone. Since dextrose does not decompose at that temperature we know it must have been levulose that disappeared. Then we put the tubes back again in the bath and kept them there 120 hours. Did they still show 10 per cent. loss? No, they showed 18 and 19 per cent. loss. These results throw discredit on this method of analysis for the determination of water in honey. Then we tried drying it at 70 degrees centigrade. We wished to see if the levulose would decompose at that temperature, and we found that it did. After 24 hours there is something like 5 per cent. loss, which under ordinary circumstances we should have ascribed to water, but which under these circumstances could only have been due to decomposition of the levulose. From this research I feel justified in making the statement that the percentages of water returned by the analysts as present in genuine honey are too high.

You must not understand that I am adversely criticizing the public analysts; they have employed the usual method by which we estimate moisture in many substances. It is only because of the presence of this peculiar constituent levulose, which is so ready of decomposition, that the method is unreliable.

It is only right that I should here add that several investigators in recent times have noted the ready decomposition of levulose above 70 degrees centigrade. Special attention is called to this fact by Carr and Sanborn in Bulletin 47, U. S. Department of Agriculture, Division of Chemistry. These authors devised an apparatus for drying in vacuo at any desired temperature, and which gave very satisfactory results.

During the coming year I purpose as time permits to follow up this investigation. We shall first endeavor to obtain a method whereby we can accurately ascertain the amount of water in honey. If we are successful in finding such a process—and I think we shall be—we shall next proceed with this question of immature and mature honey. Next year I trust I shall have something of a satisfactory nature to report to you.

One word about ripe and unripe honey. It appears that much depends upon the season—upon the honey flow—as to whether there will be much unripe honey. Much wet and cloudy weather is conducive to there being unripened honey in the hive. This past season the honey flow was good and the honey ripened up well.

Though I have brought with me several tables of data from the work on the honeys you see before you I shall not now place them on record, for I do not consider them, for the reasons I have stated, as accurate. I will make this statement, however, that the trend of our results shows that the uncapped, immature, honey contains more water than the fully capped honey. The difference appears to be in the neighborhood of two per cent.

This Association is going to appoint a committee to make a practical test of these samples which we have brought here, and when they have completed their work you will have an opportunity of examining them for yourselves.

You get some idea of the relative viscosity of the honeys by turning the bottles upside down and noticing the length of time it takes the bubble of air to ascend. The samples are merely lettered. They comprise uncapped honey, honey partly capped and honey entirely capped. The last named are the most viscous. After the Committee has reported on the quality of the honeys I will label them. We wish to learn if practical men can pick out the samples of ripe honey—if their judgment in this matter coincides with ours—which is that the capped honey is a better quality of honey than that from uncapped comb. The latter honeys were collected on July 1st, the former on August 6th.

With regard to the question of water in honey, I feel that its importance lies really in this matter of ripe and unripe honey. Water is not used as an adulterant of honey. The chief adulterant of honey is glucose syrup ; that is to say the sugar which is manufactured by the action of dilute acid upon starch. Glucose is a sort of generic term, and dextrose and levulose are specific terms. The word glucose chemically would include dextrose and levulose. Glucose is what results from the action of dilute acids upon cane sugar. It has been found in one or two instances, and it is fairly readily detected. If honey were adulterated by the addition of cane sugar that would also be comparatively easy of detection. In order to show you what genuine honey would be with the addition of 5, 10 and 15 per cent. of water, I have in these bottles such mixtures. The bottles are labelled according to their contents.

One word further about our experiments. I believe it would be better to keep the honey upstairs ; everything seems to point to that plan as producing a better class of honey : but I can not say that there is very much difference in our samples between the honeys kept in the cellar and those upstairs. It does, however, seem to be a fact that the honeys in the cheese cloth covered bottles kept in the honey room contain a little less water than those which were in the cellar, but owing to the unsatisfactory character of the examination I do not want at present to speak too definitely upon that matter.

Mr. Gemmell : I have found that the specific gravity of capped and uncapped honey is very different.

Mr. Shutt : I had a conversation with Mr. Percy Selwyn, an Ottawa bee-keeper, and he said there was a great difference between seasons in this matter. If you take a moist, damp, cold season you get watery honey, and it takes a long time to ripen up, before the bees cap it. He said if you were to take that uncapped honey in the comb you could dash it right out : but in a dry, warm season the honey would be too thick to easily leave the comb.

Honey as a Food.

With regard to the position of honey as a food, honey must be classed with the saccharine foods when considering its value. In order to intelligently appreciate its value I shall have to say something with regard to the general food constituents as found in all foods. It will not take me more than a few minutes just to

outline their nature and their composition and function in the animal system. We find that all foods comprise a greater or less quantity of the following classes of constituents: Protein or albuminoids, fats, starch and sugar, ash or mineral matter.

Now, first of all, with regard to protein or albuminoids. These materials all contain as an essential element of their constitution, nitrogen. If you asked me for an example of protein or albuminoids, I should at first name the white of egg, which is pure albumen; it is one of the purest forms in which we can obtain protein; then the curd of milk, and gluten of wheat are others. They are more or less pure forms. Fat or oil I need not describe to you, because we have in so many articles such as butter and various classes of oils materials that you are perfectly familiar with. You know what I mean when I refer to and mention the word fat. Starch and sugars are known to the general chemist as carbo-hydrates. You have already learned from what I have said that starch and sugar are related chemically so that all those substances which come underneath that head we call carbohydrates; then there is also ash or mineral matter, which, in the body, goes to form the bone. These substances you understand are present in greater or less proportion in nearly all our foods, though not in all; we shall see in that respect honey is not a complete food. All these constituents are necessary. First of all, the body requires nitrogenous matter or protein to build up its tissues. There is a continual waste of our tissue, due to muscular energy. Every time I speak a word or move my arm there is a certain waste of the system, and this must be replaced. It is due to the protein or albuminoids that this repairing of the waste of the body takes place, and consequently, in order to sustain life we must have foods which contain a certain proportion of protein or albuminoid. Such have this quality of being muscle builders, body builders. They contain nitrogen, as an essential element. The other materials, fat and starch and sugar and so on, do not contain any nitrogen. The chief intention with regard to protein and all albuminoids is to build up the body and repair the waste which hourly takes place. With regard to the fat and sugar we have materials which are useful in keeping up the heat of the body. If you put a thermometer in your mouth you will find that the temperature is somewhere in the neighborhood of 100 degrees, Fahrenheit. How is that maintained? In the same way that heat in the stove is maintained. The wood is burned in the stove; the food is burned in the body. It is really a process of combustion, and the combustion of fat and starch and sugar within our bodies gives rise to heat. Heat is only another form of energy. We know that. Therefore we are able to convert the heat produced by the combustion of our foods into physical force or energy. So that we have in these two substances fats and carbo-hydrates, those materials or constituents which have for their chief functions the development of heat and energy within our bodies. Of course the formation of fat takes place; a certain quantity of fat within the body is formed; and we further find that that fat may be formed from either one of those three substances, but chiefly from the fat and carbo-hydrates of the food. It is important for us to know that a complete food must contain all those classes of constituents, that protein or albuminoids differ from these others in possession of nitrogen, and that protein is absolutely essential and cannot be left out of our daily diet from the fact that it is necessary to build up the body and repair the waste which is constantly taking place. It is also necessary we should have a due proportion of fat and starch and sugar in order to produce the necessary heat of our bodies and for the purpose of developing energy. There is also a certain proportion of mineral matter or ash required for the development of our bones. Having said so much, where does honey come in? Honey is not a complete food, it does not contain any protein or albuminoid; it is not a body builder, it does not contain any fat, but it is a substance of great value from a saccharine standpoint. It consists of sugars, dextrose and levulose principally, consequently, we have a substance which from the food standpoint is strictly comparable with sugar.

The digestibility of a food in a large measure limits or regulates its value. It is not the food we eat that does us good, it is the food we digest and assimilate; that is,

is converted into body tissue or helps to develop heat and energy. When we take cane sugar or syrup into the mouth it is mixed with the saliva and converted into the form of glucose, and that is the form of sugar which is assimilated and passes into the blood and nourishes the body. We have that work already done in the case of honey; it is then already in the forms of dextrose and levulose, and therefore sugar in honey is in what we may term a partially digested form; it is at once presented in a condition that is immediately assimilable and may pass into the system. From this standpoint we may say that 95 parts of honey sugar are worth 100 parts of cane sugar for the purposes of assimilation. We already have been saved the expense, so to speak—the physiological expense—of conversion of that sugar into assimilable forms Honey as a food material furnishes in a palatable, wholesome and readily digestible and easily assimilable condition, sugar which may act for the production of heat, for the development of energy, and also for the formation of fat within the body. From the foregoing considerations you see we could not live on honey alone, no matter how desirable from many other standpoints, simply from the fact that it does not possess any of these protein or albuminoid substances which furnish the necessary nitrogen, neither does it furnish the bone-forming material. I think, however, it is one of the most digestible, most agreeable, most palatable and most assimilable of all forms of sugar.

With regard to its position as a medicine I cannot say very much. It is used as a demulcent and as an anti-irritant for affections of the throat and coughs and so on. It is slightly laxative in its character, and it has some value as a medicine in that connection. I think it is used medicinally principally for coughs and colds and affections of the throat, although possibly to some extent as a laxative. In former times it was employed medicinally to a much greater extent than it is now.

Honey has not only been used as a food, but also for the manufacture of a beverage. In ancient times this beverage, mead, which is really a fermented liquor, containing a considerable amount of alcohol, was used all over the northern parts of Europe. Now, I fancy the areas are very restricted in which that beverage is used or manufactured. It was known to the Greeks and Romans, and took the place of the beer of to-day.

Mr. Clarke: About what per cent. of alcohol is there in mead?

Mr. Shutt: I should suppose about 7 or 8 per cent., but I have not any data on that point. It is an interesting fact that in honey we are dealing with a substance which has been an article of food from pre-historic times; for ages and ages before Christ it was the only form of sugar known to the world. Certainly for many centuries there was no other source of sugar known besides that in honey. It appears that sugar from the sugar cane was known about 800 B.C.; it was known to the Chinese and to the Indians at that date, but it did not become an article of commerce for many centuries later. In fact, I do not think that cane sugar was largely used for a thousand years after that date. So that honey retained its position as the most used saccharine matter both for sweetening materials and for other purposes for which sugar is used, for very many centuries.

Mr. Clarke: Is there any truth in the idea that common sugar has led to the large increase of kidney diseases in later times?

Mr. Shutt: I do not think so. There are so many different kinds of kidney disease. Anyone afflicted with diabetes should of course refrain from all forms of sugar or materials which are easily converted into sugar; but I am not at all sure that it has been the indulgence in sugar that has created that disease. It is rather due to an abnormal condition of the system in which the function of the kidneys is perverted. I do not know whether the consumption of honey in this country is increasing or not, but I should suppose it were not. It does not seem to me that the general public prize and appreciate honey according to its merits. Many consider it only as a delicacy or luxury, but it is really a food of much value, and I think honey only needs judicious advertising to be found more generally on the table of our people.

Mr. Evans: In testing for water would it be possible to construct a vessel and attach it to your tube to catch the water? The vapor contains the water and the water gets away that way.

Mr. Shutt: That method would be inapplicable for the determination of water in honey, since levulose—which we have seen decomposes readily at the temperature used for drying the honey—gives off water as one of its decomposition products, we could not distinguish between the water of the honey and that formed by the splitting up of the levulose.

Mr. Holtermann: In connection with foods if lean meat is largely carbon then the man who in summer tells you you should discard lean meat must be entirely incorrect?

Prof. Shutt: Yes, I should say so.

Mr. Holtermann: Lean meat is never heat producing?

Mr. Shutt: Yes, it may be used, too, by the system for that purpose. However, if you ate nothing but lean meat you are consuming a great deal more nitrogen than is absolutely necessary for the repairing of the tissues, and giving the kidneys an extra amount of work to eliminate that nitrogen from the system. If all the food were in the form of albuminoids you would be taking in more nitrogen than is absolutely necessary and that nitrogen has to be got rid of. Now, the special function of the kidneys is to excrete that nitrogen. We must have a balanced ration in order to be economic, in order to maintain health; we must have a due proportion of protein or albuminoids, but not too much, because such would be not only a waste but an injury to the system. On the other hand, sugars and starches cannot be used alone, for they do not furnish nitrogen. They would provide the system with heat-producing constituents, but the system would be wearing out. When the food does not contain a sufficiency of protein to replace the daily waste then the body weight decreases. We must have food containing all classes of constituents, so that the body may be healthy and strong; each class of constituents has its own particular function to perform in the system.

Mr. Hall: I would like to ask Mr. Shutt a question. In liquefying honey would you advise 70 degrees centigrade?

Mr. Shutt: Yes, that is about the right temperature, say 160 degrees Fahrenheit. I would advise you to keep the temperature as low as possible.

Mr. Fixter: The object I had in view in selecting these samples of honey was to see if we could improve the quality of honey that is put upon the market at the present time, and whether, if the person keeps it on hand, the quality will improve. It has been talked over in the Association conventions several times about extracting honey when it was not capped at all or half capped or three-quarters capped. I decided to start it this summer by taking the uncapped, the half capped, and the entirely capped honey. I took on July 1st and extracted one set of frames, that is, I took the outside frames; there was an odd one capped. I left them; I did not uncap them; I extracted the honey entirely out of them and, as you see here, I have the samples. I took those and strained them off as soon as I had them extracted, and washed my can thoroughly. Then I took the half-capped frames, I think two or more of the inner frame, and I uncapped the parts of those that were sealed and extracted them and got the samples, as you see. The other ones, the centre frames, parts of those at that time were half sealed. I left the centre frames in the same hive until July 6th; it is all clover honey, and the frames were all full at that time, but the outer frames were not capped as the inner ones were at all. The centre ones were about the same as the half capped. I thought by leaving it on longer than the average person does that the honey would ripen, besides having it all sealed. That is as far as I went with those samples, and when Mr. Shutt began to talk of analyzing to find out the percentage of water it fell in line with my idea. My idea is this—of course we have not proved it—it is the opinion of many that we should allow the honey to be all capped. We have to prove those opinions, and I thought the most practical way was to have Prof. Shutt analyze those different samples and find out which was

the right way to do it. That is as far as I can go with that. And the object of bringing these samples here is to ask your President to appoint a committee of thoroughly capable men, competent to judge of the qualities of these samples from a practical standpoint, and I hope he will see his way clear to do that, and give us the benefit of their opinion.

Mr. Dickenson: Do you not think you would obtain different results in different seasons from the same experiments?

Mr. Fixter: I dare say, but we want to carry this thing on for a good many years to determine just the right time for the beekeeper to extract his honey. The general impression is it ought to be capped. If we can prove to the beekeeper he gets a far better quality, and prove by chemical analysis that one contained more water than another, I think we ought to advise the general public of that fact. There is no one experiment of any kind should be determined on 1, 2, or 3 tests; they should be conducted for a number of years so as to take in different seasons.

Mr. McEvoy: I suppose you did not leave any sealed till away on in September and October and test that as against the sealed of July?

Mr. Fixter: We did not do that. I will try that.

Mr. Hall: We find by experience honey left in the hive when the weather becomes cold and the honey flow is passed, keeps getting thinner; it absorbs the moisture.

Mr. Chrysler: I found this year about 20th June, and up a little later, uncapped honey with me was equal to about that sample of honey there which contained 5 per cent. water; but later on the uncapped honey was very much different and very much thinner.

Mr. Fixter: Did you find any difference with the same honey?

Mr. Chrysler: It was practically the same flow, the same kind of honey, but two weeks later.

Mr. Shutt: We are treating this as though the honey were capped and sealed. There may be as much change take place after the capping is put on as there is beforehand, or almost so, so that while there may be a general direction of less water when the capping is put on, still I do not say it may not go on still further or get stronger or weaker. We should not use that word "sealed"; I fancy we should say capped.

Mr. Gemmell: After I keep honey in a damp place it will absorb water and the water will run down the face of the comb.

Mr. Beaupree: The thickest honey I ever extracted was unsealed honey.

Mr. Shutt: Had you any capped honey at the same time?

Mr. Beaupree: It was in the spring. No. We extracted some for those who were at my place to test.

Mr. Dickenson: I think that the very commencing point in connection with extracting is to provide the colony with room below the super that is full of honey before you extract it. Before you extract the full super of honey to have combs whereoff. I think the honey is ripened sometimes before it is all capped by adopting that method.

Mr. McEvoy: Extract it in hot weather all you can.

Mr. Hall: Extract from the top every time.

Mr. Fixter: I put a super underneath this before I took it off, for a few days; I thought I would give them plenty of room below.

The President appointed Messrs. Hall, Pickett and Emigh as a committee to examine the honey samples and report at the afternoon meeting

AFFILIATED SOCIETIES REPORT.

There are eight societies in affiliation, namely, Halton District, Brant, Russell, York, Oxford, Norfolk, Simcoe, Glengarry and Haldimand.

Each society received a grant of $20. The six societies that have reported, namely, Halton District, Brant, Russell, York, Oxford and Norfolk, have expended the grants, largely as directed by the by-laws governing such expenditures. The reports of bees and increase of same and the yields of honey are not all that is desired.

The number of colonies reported for last spring is 2,300, and for fall 3,829, showing an increase of about 66 per cent. Comb honey produced 11,281 lbs., extracted 157,560, which shows a very good average yield of 5 pounds of comb and 68 pounds extracted on a total yield of 73 pounds, which shows one of the best average yields for some years, and it may be claimed that the quality is of the best.

W. Couse, Secretary.

FINANCIAL STATEMENT

Of the Ontario Beekeepers' Association made to the Department of Agriculture for the year ending December, 1901 :—

Receipts.		Expenditure.	
Cash on hand from previous year	$ 95 53	Grants to other societies	$225 00
Members' fees	105 00	Expenses of meetings	7 00
Legislative grant	500 00	Officers' salaries	75 00
Affiliated societies' fees	45 00	Directors' fees and expenses	152 40
For use of stenographer's report	12 60	Postage and stationery	23 97
		Printing	13 75
		Periodicals for members	68 90
		Reporting	50 00
		Executive and revising committee expenses	41 15
		Total	$657 17
		Balance on hand	$100 36
Total	$757 53		$757 53

John Newton, President.
Martin Emigh, Treasurer.

Examined and found correct this 4th day of December, 1901.

R. H. Smith, J. B. Hall, } Auditors.

Upon motion of Mr. Evans, seconded by Mr. Pickett, the foregoing report was received and adopted.

REPORT OF INSPECTOR OF APIARIES.

During 1901 I visited bee yards in the Counties of Bruce, Grey, Perth, Oxford, Waterloo, Wellington, Wentworth, Halton, Peel, York, Ontario, and Simcoe.

I inspected seventy-seven apiaries and found foul brood in twenty-nine of them and dead brood of other kinds in many others.

Some beekeepers secured the combs from others who had lost many colonies of bees and not knowing that these combs were diseased brought them home and put them into use and spread the disease in their own apiaries.

When foul brood matter dries down it glues itself fast to the lower side and bottom of the cells, and there it will remain just as long as the comb lasts, and in old dark combs the stain mark left in the cells from the disease is not noticed by those that never had any experience with foul brood.

It is when the disease becomes widely spread that the beekeepers wake up to the fact that their colonies have foul brood.

These mistakes which have so often ended in big losses from bringing diseased combs into apiaries should be a warning to beekeepers not to deal much in old combs.

No beekeeper would bring a diseased comb into his apiary if he knew that it contained foul brood, and the men that dispose of such combs do not know that they are diseased when they deal them off.

I received many letters from beekeepers asking me to visit their localities and while inspecting there to stop with them. I was much pleased with the generous treatment that I received from every person, and in turn I felt that I was in duty bound to help the people all I could in every possible way besides getting their apiaries cured of foul brood, and I did so.

I am also pleased to say that nearly all of the largest and best paying apiaries in the Province of Ontario are among the very many that I got perfectly cured of the disease years ago. My time, car fare and livery hire, $756.35.

A. McEvoy.

Woodburn, Dec. 3rd, 1901.

Mr. Holmes moved, seconded by Mr. Darling, that the report be adopted. Carried.

REPORT OF DIRECTORS.

The following report was presented by Mr. Darling :

To the members of the O.B.K.A., now in session, your Directors beg leave to present their report as follows :

It is with pleasure that we are able to report a more prosperous season generally than for several seasons heretofore. The honey crop has been fair to good in most places, while the quality has been excellent and prices somewhat higher than in the past.

The usual sum of $200 was set apart for affiliated societies, of which $180 have been paid, according to by-law.

The usual grants of $25, $10 and $10 were paid to the Toronto Industrial, Western, and Central Canada Fair Associations, respectively.

The Canadian Bee Journal and a copy of the Annual Report have been sent to each member of the Association.

There has also been 1,000 copies of Dr. Fletcher's address printed for distribution to the public.

Our finances are in a good condition, there being a balance of nearly $100 in the hands of the Treasurer, as you will see by the Auditors' Report.

In accordance with a resolution passed at our last Annual Meeting, we have put up an exhibit of honey at the Pan-American. We succeeded in securing about 3,600 pounds of honey for the exhibit, of which about 600 pounds were comb and the balance were extracted. And we are pleased to report that we were very successful as we secured the gold medal award and the different exhibitors will secure 33 diplomas of merit as well, while we have demonstrated to the world that this Ontario of ours will take no second place in the production of fine honey.

The cost of making the exhibit was about $786, but we have good reason to believe that the Ontario Government will very generously pay all costs in connection therewith, not borne by the Dominion Government, which has already assisted us in various ways, and we have no doubt will give us a money grant as well.

We are also pleased to report that we were very kindly received by the Fair authorities, and every facility afforded us to make our exhibit as attractive as possible.

All of which is respectfully submitted.

WELCOMED BY THE MAYOR.

Mayor Mearns of the City or Woodstock delivered an address of welcome, to which the President responded in a few well chosen words, and in the name of the Association thanked him for extending the welcome to the Association.

APIARY EXPERIMENTS.

By Mr. John Fixter, Central Experimental Farm, Ottawa.

Fruit. For many years the question as to whether sound fruit was injured by honey bees has been under discussion, but last year special attention was drawn to this question by a law-suit between a fruit grower and a beekeeper, the former claiming that his fruit had been seriously injured by the bees of his neighbor, while the beekeeper brought evidence to show that not only was this not the case, but that it was impossible. This question was of so much interest to beekeepers that the following experiments were undertaken to determine whether bees, even when deprived of food, would attack fruit placed within their reach. The results here given indicate that such is not the case, which merely confirms the conclusion arrived at many years ago.

On September 7, 1901, when there was no surplus honey to be gathered on plants outside, ripe fruit of four different kinds, namely, Crawford peaches, Bartlett pears, plums and grapes, were exposed in different places near the Experimental Farm apiary, where it was easily accessible to the bees. A, inside beehives; B, on the branches of trees in the apiary enclosure, and C, on shelves in a workshop to which the bees had access through an open window.

Every care was taken that all fruit used in this experiment should be perfectly sound.

A—Inside beehives. The fruit was exposed in three different conditions. 1, whole fruit without any treatment; 2, whole fruit which had been dipped in honey; 3, fruit which had been punctured in several places with the blade of a penknife.

Four colonies were selected for this experiment, all of about equal strength. Each of these colonies was in a hive upon which was placed a super divided in the middle by a partition. From two of the hives the honey had all been removed, in the two remaining hives five frames were left, each having considerable brood, with honey around it.

The former two at the beginning weighed on an average 27 pounds, the latter two 34 1-2 pounds. In each one of the four hives the whole specimens of fruit not dipped in honey were hung within three empty frames, tied together as a rack; the whole specimens of fruit dipped in honey were placed in one compartment of the super and the punctured specimens were placed in the other. The bees began to work at once both upon the dipped and the punctured fruit; the former was cleaned thoroughly of honey during the first night; upon the punctured fruit the bees clustered thickly, sucking the juice through the punctures as long as they could obtain any liquid. At the end of seven days the fruit was carefully examined. The second fruit was still uninjured in any way, but had the surfaces polished and shining, as if the bees had been travelling over it, trying to find some opening through the skin. The dipped fruit was in a like condition, quite sound, but every vestige of the honey had disappeared.

The punctured fruit was badly mutilated and worthless; beneath each puncture was a cavity, and in some instances decay had set in. The experiment was continued the following week, the undipped sound fruit being left in the brood chamber; the dipped fruit was given a new coating of honey and replaced in the super, and a fresh supply of punctured fruit was substituted for that which had been destroyed. At the

end of the second week the condition of this fruit was entirely similar to that of the first lot.

For the third week fresh supplies of fruit of all the above kinds were used, because some of the sound fruit had begun to decay; the fruit, however, had the skin unbroken, and in no case had the bees done any damage. The results were the same as before. After the third week the bees belonging to the two hives which had been deprived of the honey appeared to be very sluggish, and there were many dead bees about the entrance to the hives. These colonies had lived for the first three weeks on the punctured fruit, and on the honey off the fruit which had been dipped.

As there were at that season few plants in flower from which they could gather nectar, these bees had died of starvation, notwithstanding the proximity of the ripe, juicy fruit. This supply of food which they were urgently in need of was only separated from them by the thin skin of the fruit, which, however, this evidence seems to prove they could not puncture, as they did not do so, although they kept crawling over it continuously. The mean weight of each of these two hives on the 7th of September, when the experiment was begun, was 27 pounds. At the end of the experiment, four weeks later, each had lost 3 1-2 pounds.

The mean weight of the two hives, in each of which were left five frames, with brood and honey, was at the beginning of the experiment 34 1-2 pounds. The mean loss for each of these hives was 2 1-4 pounds.

B—Fruit exposed in the open air, hung from the branches of a spruce tree in the apiary enclosure.

In this experiment two sets of whole fruit were used, one being dipped in honey, the other punctured as before.

The bees worked exactly as in the hives, and with the same result.

C—Fruit exposed on shelves in a workshop adjoining the honey house. This like the preceding experiment, consisted of dipped fruit and punctured fruit.

Although the bees did not work so freely inside this building as they did on the fruit hung outside on the tree, and that in the hives, still the results were practically the same in every case.

The other experiments I have carried on are with the different sizes of hives, also with foundation, different kinds of brood; also setting out and wintering.

Mr. Darling: This matter of experimenting with ripe fruit which Mr. Fixter has brought to our attention is one that is of considerable importance, and it may be those very statements he has made here may be of use later on to some of those pursuing beekeeping. I remember reading some time since there were experiments along the same line carried on over on the other side of the International boundary, and with results practically the same as he has discovered. Notwithstanding that the fact remains that some individuals are making trouble for bee-keepers because, as they claim, the bees are destroying the fruit. I do not know that I can say anything that will add any interest to it. I am sure his experiments along that line have been concise and to the point. With your permission, however, I might just here digress from that matter and take up one that was laid over this forenoon, a matter I am sure that interests all of us here very much; and to use a phrase that has been used in the newspapers occasionally, I think Mr. Shutt, as well as we, has found out we have run up against the real thing. I must say I am not very much surprised, and yet I am surprised at the difficulties he has met with. We had no idea of the difficulties that would have to be encountered in testing honey for the percentage of water. I am glad, however, he has made these experiments so exhaustive, and I am sure from what he stated this forenoon that in the future there will be something good come out of it. I might say that our idea in starting this matter in the first place was not so much of applying a chemical test to the honey solely as perhaps a chemical test in connection with specific gravity in order to obtain the percentage of water. In this matter he has carried on his tests in both ways, and I think with a fair amount of satisfaction, as well as meeting with some disappointment. There were several items he mentioned that seem to correspond with our experience as bee-keepers, and he, not

being a bee-keeper, perhaps would like to know some things that have transpired in our apiaries that bear out the statements he has made. First, is the fact that the chemical nature of the honey is changed by the bee in the hive. That the honey, as we use it, is not the nectar that is taken in by the bees. I presume a great many have noticed that across the entrance of a bee-hive it is very much discolored during the process of ripening honey. That, taken in connection with the explanation he gave with regard to the texture of this levulose and dextrose, I think, explains some of the reasons why some of our honey is not as palatable as others. In fact some of them leave a disagreeable sensation on the palate and perhaps in the stomach. I have found some honey granulates a good deal easier than others, and some is sweeter than others ; he says this oily substance is sweeter than that which is granulated.

Mr. Shutt : The sweetness of it might be masked by the presence of something else.

Mr. Darling : It seems to be almost sharp. The best honeys are the honeys that have the least of this oily substance that he says will not granulate. Then there was another thought that came to me just as he was talking about those different samples of honey, some being capped and some uncapped; but as he repeated his conversation with Mr. Selwyn, of Ottawa, I can only endorse what Mr. Selwyn said, that sometimes our uncapped honey is in a better and riper condition than the capped honey is, owing to the conditions and flow of the honey. The reason why we wish to get at this amount of water in honey, or, more, as to what should constitute ripe honey as distinguished from unripe honey, is that we are confronted occasionally by honey placed upon the market by some individual that has this sharp rank taste, and also it is destitute of keeping qualities ; it will ferment if left to itself for a short time, simply because it has been taken from the hive too soon. I thought when he was narrating the difficulties he met with in determining the amount of water and the difference that occurred between the experiments of one chemist and another, that perhaps a certain length of time at a certain temperature under certain conditions to be determined might bring different men's analyses nearer together. If we wish to determine the specific gravity of honey or any other substance we bring it to 64 degrees Fahrenheit, and then we can test the specific gravity by the instrument used for the purpose. I do not think any of us had any such thought that water was used as an adulterant ; we were simply mentioning that water had been secured by the bees when they took the nectar from the flowers, and it had not had time to evaporate or be taken out. I read in an item in one of our papers of a certain man in one of the agricultural districts of England who was fined for having his butter adulterated simply because there was more than a certain percentage of water found in it. I do not know that we could fine a man for having unripe honey placed on the market, but if we can strike some means of having this thing frowned down and run out so that it is not going to destroy the sale of that which is good, these parties will come to their senses after a while, and there will be less of the unripe honey, and more of a well ripened article placed upon the market. There was one other thought. I think someone said, when asking some question, that capped honey would become thinner if left on the hive too long.

Mr. Hall : After it turns cold.

Mr. Darling : That depends on the condition ; the longer my honey is left in the hives with the bees the better flavored and thicker article I have.

Mr. Gemmell : How close is your honey to the bees ?

Mr. Darling : Right with the bees ?

Mr. Gemmell : Right in the brood chamber ?

Mr. Darling : In one compartment? If you had a couple of supers on you would find out the top super would soon get thinner. We do not want it where it will get steam from the bees, and we do not want it there if it is damp, wet weather ; but the longer honey is left with the bees, circumstances being right, the thicker, firmer and better it gets. But honey has a tendency to absorb moisture, and I do not know but it will do so fully as fast in the hive as anywhere else if the atmospheric conditions are favorable.

Mr. Gemmell: I assume from your statement that the honey was all right as long as it was left with the bees.

Mr. Darling: No. If I want a first-class article I do not want it to stay there when it would be covered with a sweat. I am certainly pleased with what Mr. Shutt has stated; he has gone to far more trouble and thought in the matter than we anticipated would be necessary. I presume we will all be pleased if, in pursuing these experiments further, he comes to some conclusion that will be of benefit to us after.

Mr. Frith: In regard to the remarks on fruit, it has been a long, agitated question and one of importance to bee-keepers. I know from my own experience the complaints that are issued against the bees in regard to the destruction of fruit are still somewhat universal and common. I was pleased to hear this paper on the experiments on the farm, it seems to prove that bees do not injure fruit that is really in a state fit for use; that there must be deterioration of some kind in the fruit where the bees will touch it; it has been punctured or the envelope of the fruit has been destroyed so that they can reach the inside contents. In regard to the transformation of honey in the hive, it has been a held theory from one end of this continent to the other, and a gentleman was here yesterday who had persisted all his lifetime, that there was a transformation of the honey in the honey hive, and we have all cried it down, and here we are confronted this morning with the fact from an actual experiment in our own Province that honey undergoes a change.

Mr. Shutt: I do not touch upon any possible changes that might take place after the honey was in the cell; it was after the collection and before the deposition in the cell.

Mr. Frith: Still, you found that there was a chemical change in the honey from the time it was gathered?

Mr. Shutt: Yes, in the nectar. It was gathered possibly in the form of glucose and deposited by the bees in the form of dextrose and levulose.

Mr. Frith: That is something astonishing to bee-keepers. We had such evidence as we thought was conclusive along that line, that there was no change whatever from the nectar, as it was gathered from the flowers, until it was served ready for the table.

Mr. Holtermann: I think there are a great many in the room who have for years fully admitted that such a change did take place.

Voices: Hear, hear.

Mr. Gemmell: I am sorry Mr. Frith was not here this morning to hear that. I think he is a little mistaken in regard to that statement. I have always understood that bees did change the material when it was being gathered, and that it was not just exactly the same as when first gathered, that the addition of formic acid or something else, or probably some of the digestive fluid belonging to the bee, made some change, and that it was in a sense digested nectar.

Mr. Hall: Mr. Shutt interested us very much this morning, and gave us some instruction, but he acknowledged he is not a bee-keeper. We speak of basswood honey, thistle honey, clover honey, raspberry honey, maple honey, and the bees can not alter any of these; they put the formic acid in for keeping purposes and evaporate the water, but they cannot eliminate the pollen grains that are in the flower. You cannot do that unless you boil them.

Mr. Frith: You say the bees project the formic acid into the honey.

Mr. Hall: When it comes in from the flowers it is not there.

Mr. Frith: I rather think the formic acid is in the honey, and that the bees accumulate it from the honey. I am rather under the impression that the heat will cause the other acids to decompose and give off formic acid. I know there are certain conditions on which certain acids coming in contact with the sun decompose and give off formic acid, and the bees accumulate it and put it into their poison.

Mr. Hall: Just boil a little honey and analyze it and see how much formic acid is in it.

Mr. Frith: I admit that that is correct. That is exactly what I said.

Mr. Shutt: What the last speaker was referring to is something different from what I was speaking of this morning in connection with the analysis of honey. There is nothing in what I said contrary to what he has just said regarding different kinds of honey. I think I said in conversation with some gentlemen that there were certain volatile oils which were there in small quantities, but they had such persistent qualities that they gave that aroma to the honey. That has nothing whatever to do with the percentage of water in honey or changes that may take place when in the bees. Of course that statement I made with regard to the action of the salivary juice of the bee upon sugar in the nectar was not given as any discovery of mine at all. My experiments did not bear upon that part of the subject, but I said that there was sufficient evidence on record of an authentic character to show that sugar in nectar was in the form of glucose, and after it was put in the cells it reformed in the shape of dextrose and levulose. I think that explanation will put us all straight.

Mr. Hall: I have nothing whatever to say against what Mr. Shutt said; it was merely with regard to what Mr. Frith said, who was not here this morning.

Mr. Fixter: I would like to hear from some of the members who have had difficulty with the bees while picking raspberries or strawberries or any other kind of fruit, if there are any, and also as to the bee working on sound fruit.

Mr. Evans: As a matter of fact I believe some of the raspberry growers have been annoyed by bees; I believe that is the only fruit they do bother. Later on in the season, when the flowers are not yielding nectar and there are small, stunted raspberries on the bushes, I find with me that the bees annoy people considerably. Fortunately at that sea on the raspberry crop is about over, and they do not amount to much. My theory of the matter is a bee cannot bite large fruit like a grape or plum; it is like a man trying to bite on the side of a pumpkin; but possibly when the raspberries are stunted and small at the end of the season the bees can bite them. That is the only kind of fruit I have heard any complaint of.

Mr. Fixter: Do you think it would be wise to try some experiments with the raspberries to see if they could puncture the sound fruit?

Mr. Dickenson: Do you know of any variety of raspberries they attack more than others?

Mr. Evans: It is the red raspberry they attack principally. Cuthbert raspberries are principally grown in my neighborhood, and that is the variety I think they are mostly found on.

The President: I think when they do attack those raspberries it is when the grower has found himself so busy he could not pick them in the proper time, and has left them standing until they were so ripe that the bees had a chance. I think a grower who knows the right time to pick his berries would have them picked, and the bees would not bother him.

Mr. McEvoy: I can endorse that. Because all berries that go to market for sale should be picked when they are ripe, and not over-ripe. When the berry is softened with rain or over-ripe is when the bee gets in her work.

Mr. Wood: A year ago this summer we had some trouble in the latter part of the season; the bees went very strongly on over-ripe raspberries, but before that I did not see them near them; and some of my neighbors complained that they lost, they estimated, 100 quarts; but I know they must have been over-ripe, the same as ours were.

Mr. Byer: We do not grow berries very extensively, but we had complaints that the bees will injure the Cuthbert raspberries

Mr. Fixter: Do you not think that the bees had an opening before they ever attempted and before they could possible do any damage?

The President: We have quite a patch of raspberries; I suppose they are probably 50 or 60 feet from our bee yard, and I have not seen the time yet but that we were able to pick all our berries without the bees bothering them.

Mr. Chalmers: In the summer we had a terrible dearth of honey in July, and there was a little patch of tame raspberries quite near my bees, and if they were not picked early in the forenoon there could not be a berry got. There was a patch of my

raspberries, and I heard the berry-pickers complain of the bees being that thick on them that they could not pick them ; and I would see the bees come in shining red with the raspberry juice.

Mr. Holtermann : I would agree with Mr. Chalmers on that question. If it is a dry season they will work on a raspberry, and they will soon make the raspberry look old and shrivelled up. But we have got another side to look at. It is not very often it does happen, and we must remember that the bees work freely on the raspberry bloom, and I am satisfied that the grower gains more than he loses by the bee in the vicinity.

Mr. Dickenson : Is there any way of managing the apiary so as to prevent the bees from working on them ?

Mr. McEvoy : We have four acres of raspberries right at the end of our apiaries, and we get through them without any trouble.

Mr. Roberts : I believe ants sometimes work on the berries, and then the bees work on them afterwards.

ELECTION OF OFFICERS.

The election of officers then took place, and resulted as given on page 3.

The Committee appointed by the President to make an examination of the samples of honey referred to by Mr. Shutt, reported, corroborating the chemical results, showing that the ripened honey contained the least water, and that their examination corroborated in every particular and coincided in three cases out of four with those results obtained in the laboratory.

Mr. Darling moved, seconded by Mr. Hall, that a vote of thanks be tendered to the Dominion Government and the Hon. Sydney Fisher, Minister of Agriculture, who, through Mr. Shutt and Mr. Fixter, have taken so much trouble and care in preparing for the Ontario Bee-keepers' Association the statements made here to-day, and in carrying out the experiments in connection therewith. Carried.

Mr. Paterson spoke with reference to, and gave particulars of, a suit that had been brought against him for $60 and costs, the plaintiff claiming that his bees were a nuisance. After some discussion it was thought that as Mr. Paterson was a member of the Union, the Union would protect him.

QUESTION DRAWER.

Q.—What is the best season of the year to introduce a queen ?

Mr. Miller : I prefer during harvest or directly after. If the queens are clipped we may exchange at that time, and even just after the honey flow I have found a very good time to introduce.

Mr. Chrysler : If the queen were introduced after the honey flow, if you are not mindful of your stores for the winter, you had better provide an extra amount of stores because the young queen will lay very late in the fall, and consequently will consume more stores during the winter.

Mr. Evans : Would it be any advantage to introduce them in the early spring, in the latter part of April or May ?

Mr. Miller : It would with me, I fancy, be a disadvantage to introduce a queen then. If there is a loss it means a heavy drain on the honey flow.

Mr. Evans : Would it be any advantage to have the queens introduced before the drones fly ?

Mr. Miller : That would be the case. If the drones were flying for six weeks probably it is sufficient. If the flow shut off short so that the drones were killed, of course there would be that difficulty.

Mr. McEvoy : Would you give us your method of introducing a queen, so that it will succeed at all times in the most stubborn cases to make a colony take a queen ?

Mr. Miller : No, I have no such method.

Q.—Which is the better, one-piece or four-piece sections ?

Mr. Miller : The four-piece section retains its shape better and makes a nicer package for the market, and a stronger package.

Mr. Smith : Which is most generally used in Canada, one piece or four piece ? I notice that upon the American side they use nearly all one-piece, while on this side I fancy the four-piece is more generally used. Which has the greatest advantages ?

Mr. Craig : I would say 50,000 one-piece to 1,000 four-piece.

Mr. Chrysler : I was going to say five to one of the one-piece. But I find those who are considered the best bee-keepers in this country are as a rule using the four-piece section.

Mr. Fixter : Have those who use the four-piece ever used the split top one-piece, and if they have do not they find that very much better than the ordinary one-piece ?

Mr. Shaver : No.

Mr. Hall : You have not taken very many thousand pounds of honey in the comb for market, otherwise you would not ask that question, because you have got a great deal of scraping to do, which, if you had not that slot in the top, you would avoid.

Mr. Smith : I used the split top bar sections which I bought from Mr. D. A. Jones first, and while they may be all right for those who use starters, if you wanted to use full sheets of foundation I do not think they are as good as the top bar not split.

Mr. Holtermann : Before Mr. Chrysler spoke I thought there was a point as to whether there are more four-piece or more one-piece sections by the best comb honey producers. They certainly use the four-piece section. I believe Mr. Hall and two or three others used them for a great many years before others did, certainly before I did, but I am satisfied that the four-piece section is the best. You can have it keep its shape better, you can get your foundation in better, because you get a well-filled section filled with foundation. I know of no method by means of which you can get a one-piece section filled, but with the four-piece section and the hot plate process you can put your foundation on the top bar before it is put together, and then have it of such a length that after the plate is taken away and after the sheet is melted down it is yet large enough to fill the section ; and, as far as I know, it is impossible to do that with a one-piece section. Now, as to the split top, I do not just agree with the view that is taken by one or two here. Mind you, I give it second place ; but with a split top you can put in a full sheet of foundation, which, as far as I know, you cannot do in any other way. Then there is another question to consider in this matter with a split top ; those who are keeping a few bees cannot go to the expense, or, perhaps better, will not, of getting appliances which are needed, and they can put in a foundation cleaner with the split top ; so that although I fully endorse the attitude in connection with the one and four piece section, I do not just agree with the attitude towards the split top. I would prefer for the amateur the split top, and for the practical man not split.

Mr. Fixter : Have you ever used the one-piece split top ?

Mr. Hall : I am very happy to say I never did. Mr. Holtermann told you that I used the four-piece section six years before I heard of a one-piece, and we got five thousand of them. With the split bar you would have to put your foundation through, and wherever there is beeswax the bees add more to it, and you have to scrape it off. It does very nice for the amateur that raises a few pounds for himself and his friends that does not need any scraping of the sections, but not for the professional ; his time is valuable.

Mr. Holtermann : I do not want any soft basswood sections either in four piece or one ; that is one great objection I have to one-piece section.

Mr. Hall : I prefer not to have it.

Mr. Fixter : I hope you will not think I prefer the split top ; we agree with what Mr. Hall says entirely. We find that the amateur will handle the split top ones better than the others. I use the others myself.

Mr. Chrysler : It is more economic for even an amateur to buy a machine than to pay the extra price of sections, even if it is only a thousand sections.

Mr. Holtermann : What price have you to pay for a proper machine to do that ?

Mr. Shaver : Make it yourself.

Mr. Chrysler : You might make a machine to do it pretty cheap, but I would invest in one.

Mr. Holtermann : I do not know of any machine that I would use that cost less than $2.

Mr. Pirie : I use a machine than costs less than ten cents—a small brush.

Mr. Hall : Mr. Pirie is a first-class comb honey producer.

Mr. Pirie : I use wax of the proper heat and a small brush. I have a block the size of the section ; have it come to the centre where you want the foundation and then use a small brush ; just lay your foundation in and draw the brush along, and just as you can draw the brush along you can put in the foundation if you have the wax at the proper heat. I put the sections together before I put the foundations in either the one or four piece sections.

Mr. Holtermann : How can you get your foundation to fill the section then ?

Mr. Pirie : I fill it all around, as far as that is concerned, or I can just fasten it at one end. I sometimes fill the section right full. I think Mr. Sibbald uses the same principle. I put in my sheet of foundation, and then after it lies against the top apply the wax.

Mr. Pirie : Yes.

Mr. Sibbald : There is another point in favor of that plan ; any little youngster can put them in, it is so simple.

Mr. Pirie : Of course you have the wax at the proper temperature. I use just a small camel's hair brush.

Q.—Which is the best smoker fuel, and what is the best and quickest way to light it ?

Mr. Miller : There are so many different opinions. Cedar bark is very good ; it burns well. If during queen clipping, or a time when I set the smoker down occasionally, I like cedar bark. If I am using it when the bees are cross, and using it continually, it burns out too rapidly. For lighting I use cotton, saturated with saltpetre, and crowd in a few shavings ; I take off a small piece of saltpetre and touch a match to the cotton and it is already lighted.

Mr. Hall : Did you try rotten elm ?

Mr. Miller : No.

Mr. Hall : Once you light that it will never go out.

Mr. Miller : Cotton will not go out if you use it properly.

The President : I use the planer shavings altogether. I find they are very convenient. They make a good smudge, and if you crowd them in pretty tightly they will last a good long while.

Mr. Shaver : Do they not get pretty hot ?

The President : No, not by throwing a handful of grass on top of it.

Mr. Brown : I generally use dry rotten wood—ash, elm, or whatever can be got, but I prefer ash.

Mr. Armstrong : I have used rotten elm for about ten years, and I have used planer shavings, and I have used cedar bark, and I have stopped with cellar bark, and am going to stay there.

Mr. Holmes : Among the different materials that I have tried to use in the smoker I find that cedar bark is far and away the most satisfactory to me at least.

Mr. Dickenson : I like cedar bark a little damp, and something on top to keep it from getting too hot.

Mr. Shaver : A little grass is good. Use Mr. Hall's smoker.

Mr. Hall : We use cedar bark, and we simply use it because it is easy for us to get, and we cut it off the lengths we want it on a block, and we put in enough to fill the smoker hard and tight ; they are straight pieces of cedar bark and not too fine, of

good heavy stuff. It will last you five hours. That is a consideration. I do not like filling a smoker; it is a nasty, dirty job, and sometimes it is pretty hard work. The other things are good, but the next best thing I use is rotten apple wood.

Mr. McEvoy: Mr. Hall's plan of cutting of the cedar bark in straight pieces and putting it in that way is very good, but if you get a cross and downright spunky colony take some June grass that is dry and twist up a good wad of that and you can hide a hive with it. I apply the smoke at the bottom and top, and then the next thing I follow with my boots and I wake them up in dead earnest.

Mr. Holtermann: Try when you get a chance this new peat fuel that is pressed into these round bricks.

Mr. Darling: Take wormwood that has been dried and see what that will do. They are conquered right off.

Mr. Fixter: I have tried all that has been spoken of here to-day and one more; it is the last one, but I think the best. It is to get an old sack that has been thrown away and roll it up the length of your smoker and the size just to fit and put a little oil or anything on the end of it, or put a few shavings in, and I find it lasts longest and there is no smell to it, and there is no oil about the end of the smoker, and it will give sufficient smoke to hide the colony, as Mr. McEvoy says. I think that system is adopted by Mr. Coggshall and very many of the largest bee-keepers in the world.

Mr. McEvoy: I have tried it and I agree that it is first rate.

Q.—Can we maintain the present better prices for honey, and how?

Mr. Miller: It is too heavy a question for me. The only way I see is what was spoken of yesterday. I think the exchange would largely help us. It would help the small producer and the man who has no outlet; I think it would help all.

Q.—Which is the most advisable, to have hives of bees placed under natural shade, or in the open and shade artificially when necessary?

Mr. Miller: I would say in the open in the spring, if I can have them in the shade of a tree during the busy season. And at that time I like the bees under them for other reasons; but early in the spring, when the trees first leaf out, I prefer to have them in the open. Not being able to have both, I place them under a tree when possible.

The President: I think when we have natural shade, unless it is too dense, it is better than using a shade board.

Mr. Fixter: I think myself that an apiary is better in the open, and provide additional shade. Supposing your trees are high, look at the great disadvantage you have in taking down your swarms; besides, in the season of the year that you want to work in the mornings it is always cooler under the trees; where you have it out in the open and just have trees enough, small ones, for the swarms to light on, I think it would be better than to have it under the high tree.

Mr. Dickenson: I do not see any difficulty in bees going into trees. If your queen is clipped they are no detriment. I do not care how high they are.

Mr. Shaver: But everybody's bees are not clipped.

Mr. Dickenson: Then they should be clipped. It is no excuse because they do not clip.

Mr. McEvoy: I endorse Mr. Miller's plan. In hot days in the summer it is not the bees only; we have got to look out for ourselves, also; and it is more comfortable under the shade, and at that time the bees do just as well as they do out in the open, but in the spring the advantage is in favor of the heat; the more the bees get the better. So go back to the old first lesson, all day in the spring, morning and evening in the summer, as far as heat is concerned. As far as swarms are concerned, we do not care anything about that; we clip. Is that the way with you, Mr. Miller?

Mr. Miller: Yes.

Mr. Pirie: Do you get as much honey under the shade?

Mr. McEvoy: I have part in and part out, and I wish I had shade for them all.

Mr. Patterson: They will work longer in the sun in the evening, but I like them under the shade in the day.

Mr. Hall : I do not see how you can have them work longer than from daylight till dark.

Mr. Smith : I have bees both under trees and in the open, and some are in the shade all day long, and I have never seen any material difference in the amount of surplus honey.

Mr. McEvoy : That is so ; none whatever.

Mr. Brown : That has been about my experience. I find a man is a great deal better off when he is under the shade than in the open.

Mr. Dickenson : I think shelter is an important thing in connection with bees that are out—shelter on the west or north side. There are rows of hives in my apiary under the shade of apple trees, and also rows in the open which I try to shade as much as possible. I do not see there is any material difference ; if any at all, I think it is in favor of those that are shaded, that are under the trees ; that is, in the quantity of honey.

Mr. Darling : I have not been trying any experiments, but there are somewhere about a dozen swarms this year left under apple trees, and I found that the heaviest colony I had in the yard was one of the hives sitting under an apple tree. I think, take them right through, that those under the shade would hold their own with the rest.

Mr. McEvoy : Mr. Dickenson has a good chance to know. He has about 150 colonies in an apple orchard ; part are under trees in rows and part are outside.

Mr. Fixter : An apple orchard is quite different from large elms and maples.

Mr. Miller : It was only an orchard I had reference to.

Mr. Dickenson : In the discussion, I had principally in my mind orchards.

Q.—In wintering outdoors is it advisable to pack the bees for wintering prior to November 1st ?

Mr. Miller : That would depend on the weather. I like my bees packed by about the 20th October in case of damp chilly weather. If it remained bright and reasonably warm I see no reason why it would be any harm to leave them ; they could be packed by the 1st November.

Mr. Shaver : You would not want them disturbed much in packing after that time.

Mr. Miller : Not later than that. Of course you could not pack them without disturbing them more or less.

Mr. McEvoy : I think Mr. Shaver had reference to late packing, disturbing them in cold weather.

Mr. Holtermann : There is an important point there that has not been touched upon, I think, and that is in connection with keeping the stores in proper condition. When you pack early—and I can see no objection to even October 1st—then the bees being warm will spread more over the combs and they will keep the stores in a better condition for winter, whilst if you let them stand outside and they are exposed to the dampness and cold in the fall of the year the bees contract and the honey takes up a certain amount of moisture, and becomes thinner and is less fit for stores for winter. So I believe the right thing to do is, about as early as you can, get them in condition for wintering, and then pack them. I do not know whether there is any reason for it or not, but the policy I have pursued is to keep off a portion of the top packing until later; there may be nothing in that, but that is what I have done, and then when the cold weather came I then added to the top packing.

Mr. Chrysler : I like to see chilly weather, quite a little freeze, so that they will spread over—there are some bees that do not cluster. Some will form into a cluster, but a great many still remain outside and are chilled and never come to life again. I believe in packing about the 1st November, not later. I find the chilly weather seems to help them a little.

Mr. Hall : Our packing was put on the 16th October, and we would have done it cluster up in the smallest space possible. I find a great many times that they will two weeks before if we had had the time to do it. We did not reckon it too soon.

Mr. Armstrong: I would like to ask Mr. Chrysler if he leaves them to the 1st or 10th November, and if he takes the cover or quilt off if there is not a certain amount of moisture all round, and sometimes down the side of the comb?

Mr. Chrysler: I have not found the least moisture this year.

Mr. Pirie: I think the earlier they are packed the better.

Q.—Which will pay the best, extracting honey at nine cents or comb honey at $1.80 per dozen?

Mr. Miller: Comb, if there is a ready market at that price.

Mr. McEvoy: That will depend somewhat on the hiving.

Mr. Miller: I certainly expect a man undertaking comb honey at $1.80 a case will understand how to produce it.

Mr. Shaver: That is all right, but I think the majority of us will take the nine cents.

Mr. Hall: You have not been used to taking comb honey; if you had you would be able to take comb honey for less money than you are talking about. Extracted honey must be attended to in the hot season. You can make the preparation for comb honey previously and you can take it off later, and you can get about 80 per cent. of comb honey to 100 per cent. of extracted honey. That is my conviction from experience. We have taken as high as 228 pounds of comb honey from a colony of bees, but never of extracted honey. The last comb honey I took I had to sell for $1.10 and $1.50 a dozen, but if I can get $1.80 a dozen I will produce no extracted honey whatever.

Mr. Dickenson: Do not you think the seasons are getting shorter, and owing to that and other conditions that extracted honey at nine cents is more profitable than comb honey at twenty cents?

Mr. Hall: Possibly. It is true in favor of your extracted honey that you can extract every ounce, and in the other if you do not watch and look out for your season you will have a lot of culls. We used to take our culls away, and sell them for a better price than we got for No. 1 honey.

Mr. Dickenson: It strikes me the wax should be taken into consideration. I have got 200 pounds of wax this year only from this year's produce, and I have got an accumulation of that. I do not think I would have had that if I had been selling comb honey.

Mr. Miller: That is very true, but the difference during the season when you can take 60 to 70 pounds of honey, do you calculate an average through your yard of that that season? I contend the margin between nine and fifteen cents will more than counterbalance that with the specialist who can produce a nice article in comb honey.

Mr. Smith: At the prices given I should certainly raise the section honey, and I find it is the nicest thing you can produce.

Mr. McEvoy: After all, this will depend a good deal upon the readiness to market. The extracted is ready, keep it where you will, but it is not so with comb.

Mr. Smith: It depends a great deal on the locality. In the southern part of the Province you can raise comb honey much more readily than in the middle or northern parts. I have tried to raise it in the northern districts, and gave it up and found extracted honey was much more profitable.

Mr. Holtermann: Do you not think you can account for that in part by the fact that you know a great deal more about it now than you did?

Mr. Smith: Yes, but in the northern districts we are apt to have cold waves and cold nights especially, and unless you gave it special protection very often when the bees were working well in the sections and would probably get them almost ready to cap, a cold wave would come and drive them out of the sections, and you would have a large per centage of culls left on your hands.

THE NEW PRESIDENT.

President-elect Evans took the chair, and returned thanks for his election to the position. He called upon Mr. Conse to read a paper by Mr. Hutchinson of Flint, Michigan, who unfortunately could not be present at the convention.

HOW ONE MAN, ALONE, MANAGED 500 COLONIES FOR COMB HONEY IN OUT-APIARIES.

By W. Z. Hutchinson, Flint, Michigan.

I had hoped and expected to be with you at this convention, but, when at the Buffalo meeting, not dreaming of a confliction of dates, I promised to attend the meeting of the Minnesota State Bee-keepers' Convention, which is now in session. The Chicago meeting, which I had hoped to attend, is also now in session. Hoping that I may be with you next year, and that you may have a pleasant and profitable meeting this year, I will now proceed to tell how one man, alone, Mr. Charles Koeppen, formerly of this place, but now in Virginia, managed 500 colonies, for comb honey, in out-apiaries.

He bought bees, and increased them, and built up to 500 colonies, under difficulties that would have discouraged any ordinary mortal. Almost his first experience was that of buying 30 colonies of bees, for $300, and seeing them die of foul brood the next year. He was green at the business, and did not know enough about this disease to recognize it. The bees were in chaff hives; and, by the way, he continued to use those hives as long as he remained in Michigan. He disinfected them with a strong solution of carbolic acid. I do not know how strong it was, but he said that it ate the splinters off the broom with which it was applied. I presume my friend McEvoy would say that this precaution was unnecessary. Be that as it may, foul brood has never developed in those hives since they were thus treated.

After getting some experience, and a few crops of honey, his enthusiasm and confidence became such that he bought bees largely, going in debt for some of them. Then poor seasons came on, and not only did the bees that were expected to pay for themselves, fail to store any honey, but had to be fed both spring and fall. In one instance he fed the bees in the spring to keep them from starving, and cared for them all through the summer, only to find that they must be fed in the fall, and, rather than do this, he let them go back to the man of whom he bought them, losing his time and the spring feed. It was under such discouragements that he worked away and built up five out-apairies of nearly 100 colonies in each. Then came good seasons, and he was able to buy houses and lots and put money in the bank.

The wonderful thing about this is that he has done all of the work alone with his own hands. Briefly, his methods are as follows: He winters most of his bees out of doors, protecting them with chaff. He waits until as late as possible in the fall, sets the hives in a long row, with boards at the back and front, and then packs the hives in chaff, putting two inches in front, three or four at the back, and five or six on top, covering all with shade-boards, covers, or water-proof building paper. Some of his colonies are in the chaff hives above mentioned, but he does not like them, as they are too expensive, and too bungling and heavy to handle to the best advantage.

In the spring the bees are looked over, stores equalized, and all extra combs removed, the bees being crowded upon as few combs as possible. When the packing is removed, each alternate hive is moved ahead a little ways, and the other hives moved back a little, and then in a few days the distances are increased until the hives are sufficiently scattered. As soon as the bees are crowded for room, the combs are spread and empty combs put in the center. This is usually done the first time just before the

harvest from white clover. A week or ten days later the colonies are again gone over, and the combs of sealed brood in the center shifted to the outside; the outside combs, that are largely filled with honey, being moved to the center of the brood nest. At the opening of the basswood flow, the brood nests are again overhauled, and this shifting process gone through with; but, in many instances, in fact, in most instances, that is if the colony is strong enough, two combs of bees and brood are taken away and used in starting a nucleus: their places, in the center of the brood nest being filled with empty combs. Each nucleus is furnished with a queen cell, plenty of which will be found in overhauling the colonies. The empty combs that are placed in the center of the brood nest, at the last overhauling, are usually filled, to a great extent, with honey; but, as soon as the flow begins to slack up, the honey will be removed and used in finishing up what sections may be on the hives. It is astonishing how a colony so treated will go on finishing up its sections after the flow from basswood is over.

With this management there is very little swarming, and, as the queens are clipped, the swarm always returns, and, usually the queen gets back into her own hive. If she does not, the fact is shown at the next examination. Mr. Koeppen says that if he can get around and examine each colony as often as once a week there is practically no swarming. Upon reaching an apiary, if there is not time enough to go over the whole number of colonies, the strongest ones are selected for that purpose.

Comparing one location with another, and one year with another, Mr. Koeppen believes that it is more profitable to keep not more than 50 colonies in one location. None of his apiaries are nearer each other than three miles. His principal honey resources are white and alsike clovers, and basswood. One of his apiaries was located near a river-bottom, and he often secured 25 pounds of surplus in the fall from this yard when nothing was secured from the others.

During the last three years that he was in Michigan he secured, on an average, each year 20,000 pounds of comb honey.

His wife was a Virginia girl, and she persuaded him to move to her old home, else I presume, he would still be piling up comb honey in Michigan.

Mr. Hall: I am not capable of managing 500 colonies of bees for comb honey. I would like to hear from someone that is. I am behind the age, I am not up to that. Perhaps I am too old; perhaps I am too lazy.

Mr. Frith: My experience is that our larger beekeepers are gradually moving slowly away from the large quantities of bees, but if a man can overtake 500 colonies and do it himself well and good. I met with a man, when we were sent down to Ottawa, who had 2,000 colonies of bees in the State of Maine, and partly in Canada. It has always been a mystery to me how they could manage these profitably.

Mr. Dickenson: In listening to the paper read by our Secretary with regard to the gentleman in Michigan managing five apiaries of 100 colonies each, it is too much to expect. I know something about the management of one apiary, and I will not undertake, no, if I never get a pound of honey, to manage that myself; I simply say it is too much to expect any man to do.

Mr. Hall: I can manage 200 colonies of bees if you let me prepare for them in the winter and give me a horse when I wish, but I tell you the sweat runs out of me very often, and I would not attempt to manage any more, and the man that can manage 500 colonies of bees alone I think is a dream.

Mr. Miller: Those who take the Review will probably remember this same article was published in it about three or four years ago, and I assure Mr. Hall it is no dream. It seems to me he had that system that he had everything prepared, and as the season advanced in the way of supers and taking off the honey, he did nothing but put them on and remove them and keep down swarming.

Mr. Hall: That manipulation will keep him busy all the time without any other work.

Mr. Holtermann: He would have to have in stock about 1,500 comb honey supers with foundation in, that he would not know whether he was going to use that

season or not. There are a great many points that when you go into the details it seems to me utterly impracticable.

Mr. Miller: If a man is going to keep 500 colonies it does not matter what amount of super room he requires, it should be provided.

Mr. Holmes: Like the other gentlemen who have expressed their views on this matter, so far as managing an average sized apiary is concerned, I entertain no serious objections, but when it comes to managing 500 colonies of bees, if I had 500 I would certainly hire a foreman and retire from the business. I entertain very serious objections to managing that many myself. I love to see beautiful figures on paper. Someone has intimated that the man was dreaming. I hope not.

A vote of thanks was tendered Mr. Hutchison for his paper.

The Secretary read a letter from Mr. Coggshall expressing his regret at his inability to be present at the Convention.

SPRAYING.

The Secretary read a letter from the Secretary of the York Beekeepers' Association, dated Nov. 11, 1901, re spraying.

The President: As far as spraying in my neighborhood is concerned, we have no trouble whatever; the fruit growers are educated. Fruit spraying during bloom is going out of practice.

Mr. Byer read a letter of November 12th, 1901, from the Minister of Agriculture, Hon. John Dryden, and said: My views are much the same as those of the Minister of Agriculture; I have no fear of being injured by the trees being sprayed in my immediate vicinity. Whenever I have the privilege of meeting anyone who I think is not properly informed as to the question I am happy to inform them, but I would not wish to throw any water on any scheme that might be to the interests of beekeepers at large.

Mr. Wood: I am very glad that spraying in bloom is decreasing in some parts. I am sorry to say in my part it is the reverse. I have had two cases that I have summoned before the magistrate. One case I lost. However, last spring I got a conviction.

Mr. Emigh: I would like to ask Mr. Wood whether it was a large or small fruit grower that did this spraying.

Mr. Wood: He has an orchard of ten acres.

Emigh: That is different from what I would expect. I did not think there were many of the large fruit growers that sprayed while the fruit was in bloom.

Mr. Byer: Is there any law on the statute book that is violated less than this law? I do not think there are any laws that are not violated, and I think we ought to have patience. I am happy to say to-day I do not believe there is a farmer within seven or eight miles of us but falls right in line with our views, and this spring there were some that even offered compensation to any beekeeper that would bring bees and place them on their farms; and one man who five years ago was opposed to bees this year offered to drive twenty-five miles and bring the bees to his place. Which shows we are educating the people.

Mr. Couse: I had an offer which I spoke of last year, the same man came this year and said, "Come over and see the place; if you do not come somebody else will." I went there, and he gave me the lumber to put up the building, and he says I can have it as long as I want it if I will stay with him. I never in my life saw such bloom; there was 200 acres with a sea of bloom of alsike; it was the most beautiful sight you ever saw.

Mr. Craig: Is it not a fact that the penalty is altogether to small to prevent anyone from breaking the law?

Mr. Gemmell: I was on the committee that appeared before the Government Committee at the time the matter was brought up; we were strongly in favor of having the fine a great deal larger than it was, but we found it was opposed by quite a

number of fruit growers at the time, and they thought it was quite enough, so we had to let the matter go at the time. Since the law came into force the fruit growers in our district are becoming educated and there is less spraying during bloom is being done.

Mr. Hall: People have quit spraying fruit in our district as far as I am concerned; the people are educated; they do not bother us, and we do not lose any from spraying trees.

The President: The question before the Association is whether we shall ask to have labels put on poisoned instruments. There is another communication here on the same lines from Simcoe Association. I will ask the Secretary to read it. The Secretary read the communication.

The President called for a motion on the subject, but no action was taken.

UNFINISHED BUSINESS.

Mr. Gemmell moved, seconded by Mr. Brown, that a vote of thanks be tendered to Prof. Harrison for his excellent address and for being present at this meeting. Carried.

Mr. Dickenson moved, seconded by Mr. Overholt, that a vote of thanks be tendered by this Association to the local press for the manner in which they have reported the deliberations of this body. Carried.

QUESTION DRAWER.

Q.—Should honey be strained or skimmed?

Mr. Brown: My impression is it should be strained, but in case there would be found any foreign matter floating on top of the honey afterwards, have it skimmed. I strain it through cheesecloth, draw it from the extracting can; empty it into another tank covered over with cheesecloth and strain it; then draw the honey from the tank and fill it into the small cans or bottles as the case may be. I usually find quite a bit of floating material; I consider it pollen or pollen grains or wax down in the bottom of the case; this I would skim or otherwise draw off; but I consider we cannot get along very well without first straining the honey.

Mr. Dickenson: I want to strain, and I want to skim. I want to strain through a finer strainer than cheesecloth to make a nice clear job.

Mr. McEvoy: I am in favor of both skimming and straining. Take a barrel and put cheesecloth over it, and slip a hoop around the top tight, and then throw a second cheesecloth over that and pour the honey through. After it stands for a week or more there will be a very fine scum gathered on the top; skim that off clear. But all the honey should be carefully strained.

Mr. Brown: Strain first and if necessary skim afterwards.

Mr. Shaver: Does Mr. McEvoy like to leave his honey open for a week or two weeks without canning in barrels?

Mr. McEvoy: Yes, I have to; that is the shape I am in.

Mr. Shaver: Will that not froth raise in less time than that?

Mr. McEvoy: It will, but still after you skim it in three or four days you will find a little fine scum very thin.

Mr. Shaver: Do you not lose your flavor inside of two weeks?

Mr. McEvoy: You lose a little, I admit, but if it is really dead ripe, it is so little you will hardly detect it.

Mr. Holmes: There is a point to be guarded in this discussion, it strikes me. The uninitiated might get a wrong idea as to what we are talking of when we are talking about skimming the honey. I think it should be made very plain that what

we are talking about is very small little bubbles that float on the top of the honey and froth, and not any foreign substance.

Mr. Hall: Tell them it is small particles of honey comb. We have large combs which hold from 8 to 10 pounds of honey and we have to shave off the cappings on each side, and in doing that they do not all fall into the capping pan.

The President: What is that scum that rises?

Mr. Hall: Pollen and very small particles of honey comb; more of it honey comb than pollen.

Mr. Dickenson: Clearness is a very important thing in extracted honey. Have a clear article, so that you can take it up and examine it and see nothing, and if you strain through that cheesecloth, and I strain through something finer, I will beat you every time in clearness.

Mr. Brown: I use a double ply of cheesecloth, and yet I find some floating material on top of the honey. When the honey is cold if it is not strained immediately I find it will not go through this material until it is warm from the stove, and when it is heated I think there must be some particles of wax of the caps that has melted and got down into the honey, and this I claim should be skimmed.

Mr. Pirie: I think the riper the honey the less sediment there is.

Mr. Roberts: I have tried several different kinds of strainers for extracting honey and I find nothing better than having a strainer made to fit the top of the honey tank with a band on the outside, and in the bottom of that is this wire cord, and on top of that I have a three-legged strainer with perforated tin. I first put it in the top; it goes straight through the perforated tin and it runs down through the strainer, and I get very little sediment, or only the very finest of the stuff in this fine strainer, and it makes a perfectly clear and nice strained honey. I find it works splendidly.

Mr. Newton: I perfectly agree with Mr. Dickenson; and the clearness of our honey was one of the things I admired while at Buffalo. I think in liquefying we ought to use a strainer to catch anything and make the honey nice and clear.

Mr. Armstrong: If you have got to skim at all why not do away with the strainer? I will tell you how I do: My extractor holds about 120 pounds below the basket. I always keep that pretty well filled up. These small particles are always rising to the top, and I always attempt to keep it as near full as possible, drawing off and drawing off, at the same time the particles are always rising to the top, therefore when I draw it off from the extractor there is very little small particles in it; then I fill my storing can and the honey is warm and it quickly rises to the top.

As I understand Mr. McEvoy, they have got to skim these small particles. They say, 'froth": I do not like that word. I think it is just the small particles of comb, and it rises to the top whatever little there is; and after it goes through the strainer I just fill my tanks, and I can skim that little particle off. I am not very particular about taking quite a depth, and I go down deep enough so that I get everything, and my honey comes pretty near the mark. I will ask Mr. Newton if what I sent over to the Pan-American was not all right, and that was not skimmed.

Mr. Smith: Mr. Armstrong has covered a good deal of the ground of what I was going to say. We adopt his plan nearly altogether, and I may say we had some at the Pan-American, too, and I will ask Mr. Newton if he did not find our honey just as clear as the most that was there, and we do not skim; we do not find it necessary. It was I who asked that question, because I know there are some that neither skim nor strain. At least, judging from the honey they put on the market you would think so: it is full of bees' wings and legs and various other things, but I think it should be at least thoroughly strained.

Mr. McEvoy: We have got past the straining point in one sense, but not in another. You take a 600-pound barrel and although I will put it through these two cheesecloths at the bottom of that barrel you may find perhaps nearly half a teaspoonful of little fine bubbles, and whether it was from the bees or how it got there I do not know. But if settled there, it did not rise, and if I put it through the two sets of cheesecloth I would catch that.

Mr. Sibbald : Did you wash the barrel out ?

Mr. McEvoy : The barrel was thoroughly washed, but the last lot you would draw from the barrel if you did not strain—you could skim all you liked—you would get maybe half a teaspoonful at the bottom of the barrel. You would not want that to go out.

The President : I have strained, but I do not skim. I have about half a dozen old extractor cans that I have picked up at sales, and I put a strainer cloth on top and tie it with a rope, and when I go to fill up my cans I fill them, and the last pail or two that comes out I just simply strain it again.

Mr. Hall : I have a tank that only holds 350 pounds, and when I take from six to nine hundred pounds in a day it has to go through that tank, and I use a strainer simply to catch these particles of comb or a fly that might get in it. If I have lots of time to let it rise, it is to get it into 60-pound tins and take it home. I would not give anything for a skimmer ; I strain it so that I can can it and get it home. I prefer to can my honey up immediately after extracting it, or after it is clear, to keep the aroma. If you want better than that use green baize, which they make fiddle bags of. But my friend Post never strains his honey, and he gets lots of prizes. I do not care how you strain your honey, you will have some sediment at the bottom. When I get down to 30 or 40 pounds I put that by itself ; I do something else with that honey besides giving it to the public.

Mr. Holtermann : I just want to say in the first place that there is certainly a wrong impression about pollen rising to the top; the wax scales are of an oily nature, and lighter and will float, but pollen grains will certainly go to the bottom. Now, in the next place, there is this discussion about being able to tell by the extractor when the can is full, and the advisability of having a hoop to raise it. There is a much better way ; have a frame that rests on top of the can, and the square opening in the centre of it. Now have your cloths on a square frame to conform to the size of that, and that frame rests on the edge, the cloth hangs through, and just as you pour your honey in you need not raise a hoop or anything else ; you can tell just exactly when the can is full.

Mr. Dickenson : There are so many ways of straining, and some, it appears, are very much in favor of not straining at all. I do not use the cheese cloth at all ; I use a double strainer. I run my honey from a stand, and it simply runs through till the 300-pound tank is full : the extractor is constantly running, and it runs through a double strainer of wire. The first strainer is course and the next is the finest I can buy. The milk strainer wire is the finest I can buy. If it will not run through fast enough I move my extractor to the next can till that gets run ; and you can run sometimes an hour at a stretch and then pass to the next.

Q.—Did anyone ever find foul brood in drone comb, or brood ?

Mr. McEvoy : Yes, that is easily found.

Q.—Have you heard of Mr. Armstrong's eye-water ?

Mr. Armstrong : That is a kind of surprise to me. I did not think I was doing any business along that line at all. Perhaps the person who put in that question would rise to his feet and tell us something about it.

Mr. Trender : I had very sore eyes, and Mr. Armstrong told me to take a drop of honey, warm it in a spoon, and drop a drop into each eye ; and my eyes have been cured completely.

Q.—Has anyone got watermelon honey ?

Mr. Brown : We do not grow watermelons extensively enough in our district to know whether the bees work on them or not.

Mr. Fixter : They will work on watermelon all right if there is an opening made for them. When they are testing watermelons at the Experimental Farm they have to get inside a building so that the bees will not crowd around them.

Mr. Trender : That is a bad thing for the bees. With me, they went to work and filled everything up where the brood had been hatched was, with watermelon honey, and of course the consequence was I did not know anything about it. This was in the centre all the time, and the sealed comb honey was on the outside, and when I came to look at

them this spring I lost 16 swarms with the diarrhoea. Mr. Armstrong came along and he said that was what was wrong.

Q.—What would be a good honey plant to sow on waste land ?

Mr. Brown : I would say sweet clover. That is in stony or waste land. Of course in a wet or damp place I do not think it would succeed.

Mr. Evans : It grows on the flats of the Humber, not far from me. It will grow in wet places.

Mr. Roberts : I find that alsike clover grows better thany anything else; I have found it in low damp ground.

Mr. Couse : I think, as Mr. Brown has said, there is nothing like sweet clover in waste ground. If you can get ground that will take it you can sow it once and that is all you need. I knew a man that sowed some about twenty years ago. That clover is there yet, and it is not only there but it is following the waggons all over the country to waste places. To get rid of the sweet clover you only need to plow, that is all. I pass a place fifteen or twenty times a day near home where sweet clover had floated down the creek and got in it and spread over the whole place. A man plowed the place for a potato patch and now there is no clover in that. Now I have often thought of Muskoka; there is a great deal of waste ground there, and if a man were to go there after a fire and sow his sweet clover in the waste places I believe he could get lots of honey and shoot deer and live on it.

Mr. Smith : I have had a little experience in sowing sweet clover in Muskoka. If you get in the unsettled districts it may succeed, but the cows run through the bush and just as soon as the sweet clover grows up it is eaten off. We find in our locality it grows best on gravelly soil, and in one particular place we have a gravel pit, and they are drawing gravel from it all the time, and it seems to be full of seed and they are scattering it around the country in that way.

Mr. Chrysler : I do not like sweet clover honey to sell except to the trade. I do not like it, and as it is a clear honey it is more liable to be mixed with other honey and spoil the other clover honey. It will be put on the market as clover honey and it does not correspond with our alsike clover, and I think there is great danger of getting the two things mixed and spoiling the trade.

Mr. Evans : Does sweet clover actually produce much surplus honey ?

Mr. Chrysler : No ; it does not.

Mr. Couse : Yes ; it does.

Mr. McEvoy : Sometimes it does—a good deal.

Mr. Chrysler : My experience has been that take it in the last fifteen years it has been a detriment to us, yielding honey sparingly for a great many years. Just keeping the queen laying and consuming all the honey, and in the fall we will not have enough. We would have to feed for the winter more than if we had not had it. Although taking one year with another, I would not give a fig for it ; besides, it has damaged this year there has been a surplus gained from it, and one or two years previous to this, my trade in honey if I should neglect to keep it separate.

Mr. Couse : I said yes. I never had much experience in getting surplus. The simple reason was because we had not enough sweet clover. I did not know exactly what it was until this season I believe I did. I had an idea that sweet clover had a greenish tinge, and I thought I understood the aroma from it. I went to Buffalo and Mr. Hershiser showed me honey, and I smelled it and I said, what is that? I said, "If I am right that is sweet clover honey." He said, "Why, yes it is; that is just exactly what it is." I said "Do you get much of it ?" He said, "Yes, that is what we are getting. We have taken all these sections and all this extracted honey from it." That was sweet clover, and he got a large surplus.

Mr. Hall : We had a large field of it.

Mr. Couse: Yes, all around the city of Buffalo. And I understand Chicago is the same way; they get all their surplus honey from sweet clover. That is the reason Pirie is going to Muskoka.

Mr. Hall: We have not the quantity of sweet clover that Mr. Couse is talking about them having in Buffalo and Chicago, but some foolish person has scattered some sweet clover both north, east and south of the city of Woodstock, that is a perfect curse to me. First, they gave me the curse of sowing it. The only benefit I can see that we derive from it is it amuses the bees and keeps them from the stores and from the ladies when they are doing their preserving; but it is a curse to us. There is just sufficient honey in it to keep the queen laying and raising brood, and at the end of the sweet clover bloom they are lighter. We have not much of it, but I certainly wish we had less.

Mr. Evans: That is my idea of it. Not far from me on the flats of the Humber there are probably 10 acres of sweet clover. I took a dozen hives of bees there some years ago, and they did not increase five pounds in weight.

Mr. Armstrong: I was a little surprised at Mr. Chrysler's statement. There was a sample of sweet clover honey on this table yesterday or the day before, but I did not happen to bring it along this morning; and I would be safe in saying two-thirds of the members who sampled that honey said, "I rather like that." And they just said the same as I say. I did not know what sweet clover was before I went to Buffalo, but I might be safe in saying there are hundreds of acres there, and Mr. Hershiser told me the same thing as Mr. Couse told you.

Mr. Chrysler: I did, too, but it is not like mine. I will say I think there is only a portion of sweet clover in it.

Mr. Armstrong: I thought Mr. Hershiser knew what he was talking about, and I saw this place, and I was at different places around the city of Buffalo, and I did not see any other clover of any kind, and this was gathered late as I understand him. I said to him, "I want a sample of that honey before I go home." And he went and got me this sample and gave it to me, and as soon as I smelled it I could tell what it was without tasting it.

Mr. Newton: I can only corroborate the statements made by Mr. Couse and Mr. Armstrong. There was one thing which came to my notice that has not been mentioned; there are two colors of bloom, and the bloom that seemed to be so much in Buffalo was a yellow bloom. I notice most of the sweet clover we have in this neighborhood is a white bloom, and I asked Mr. Hershiser how it was there, and he said there was a majority of the yellow bloom and it produced more honey than the white bloom did.

Mr. McEvoy: I am sorry to say I cannot agree with some of them. The difference may be between the two colors. I was once that strongly in favor of it that I would like to have had bushels of it sown through the country, and the wooded land seeded down. I am thankful I did not get an ounce of it. Sweet clover in its purity I do not like, and I do not want it mixed with my other, because, after all, it has a little of the weedy taste. It will yield in certain seasons well, but it has the taste.

Mr. Brown: Does it not come in usually after the flow of the white or alsike clover? Does it not usually come in with Golden Rod?

Mr. McEvoy: I have tasted it in its purity when it came in ahead of these others.

Mr. Robb: I think the largest crop of honey got in the United States last year was got in Utah, and from white sweet clover; and an article I read in Gleanings pronounced it A1.

Mr. Chrysler: The A. No. 1 article sometimes in some places does not correspond with what we would call a No. 1 article. As regards the white and yellow bloom of the sweet clover I might say that this year I really believe I had more sweet clover in my vicinity than in any other location probably in Canada; standing some of it eight feet high; and I am pretty certain that the bees got little or nothing else from any other source during that time that I got that surplus from sweet clover, and I think positively that what I got was pure sweet clover from the white bloom. There is some of the yellow bloom, but it is about three miles off.

Mr. Couse: What is the color of the honey?

Mr. Chrysler: It has a greenish tinge. To look through the combs you would think it was white clover or basswood honey; but when in glass jars I could not exactly state. It looks very clear. I find it improved by standing open in a very warm room and thickened up.

Mr. Switzer: My apiary is in the vicinity of this white clover, a good deal of it, and there is quite a green tingle in this honey. For a good while I did not know where it came from, or what was the source, but from remarks that have been thrown out here to-day it certainly is this sweet clover honey. It would be green sometimes when uncapped in the comb, as though it were mixed with Paris green. The bees are working on it from the spring all summer until the fall, and it spoils the good clear white clover or alsike honey. There is no doubt of it, it gives it a darker color and also destroys the flavor. The object in asking that question was to see if there was not something better for waste land than sweet clover.

Mr. Evans: I do not think there is anything the beekeeper could sow on waste land better than alsike clover.

The Secretary read a telegram from Prof. Mills regretting his inability to be present at the meeting.

Q.—In marketing extracted honey should we fill the tin or weigh in exactly 60 pounds net?

Mr. Brown: I would say 60 pounds net of honey. If you are selling a 60-pound tin of honey the customer naturally expects to get 60 pounds of honey. Otherwise, if he empties out the can and weighs the empty can and finds there is not 60 pounds he is apt to take the price off.

Mr. Sibbald: A great many people in putting up honey put odd weights in 60-pound tins; some will fill the tin right up full, and you know you cannot put that in the tank to pull it without taking some out first; it will overflow. Others put in 63, 62, 62 1-2 pounds, and all odd weights. What I mean is should not we put in 60 pounds net in each tin the same as Mr. Brown says?

Mr. Gemmell: I always put in 63 pounds; if they want to liquefy it they can easily take a little out. If you have a tin that will hold 63 pounds why not put in 63 pounds?

Mr. Couse: You do not get paid for the three pounds.

Mr. Gemmell: Certainly I do, every time. I tell them when they liquefy this honey and take it out and weigh the tin they will find they have 63 pounds of honey.

Mr. Craig: I believe the wholesale buyers would much prefer having some regular amount in the can. It is much more convenient.

Mr. Gemmell: There is a great difference in the size of those so-called 60-pound tins. I have had them where I could put in 66 pounds. I do not want to call a 60-pound can a 60-pound can if I can put in five or six more pounds in it. It depends on the manufacturer who makes the tins.

Mr. Chrysler: It depends on the honey, too. I have seen beekeepers who could only get 58 pounds of honey in a 60-pound tin.

Mr. Darling: I have put in 66 pounds.

Mr. Couse: The question is if a man sends me an order for 60 pounds of honey and I quote him honey at 9 cents, and he says, "Send me 60 pounds." What does that mean? Suppose I quote him honey in 10-pound cans at 9 cents. What does it mean: If you put your honey up in 60-pound tins that costs you 50 cents: if you put them in 10-pound tins that costs you $1; or in 3-pound cans that costs you $3. He expects to get them at the same price right along. Can you do it? It ought to be understood that the cans are or are not to be thrown in. If a man asked me I will sell him honey at a certain price; if he wants it put up I will put it in certain tins for a certain price. If a man comes along with a barrel I will fill it up for him at the honey price, but if I put it up in cans I want my money for those cans

Mr. Evans: As I understand the question it is this: A man is filling 60-pound cans and he is selling to a dealer who wants twenty or thirty. Are you going

to have them all odd weights or are you going to have every can net 60 pounds? The point Mr. Sibbald made was if you fill those cans very full they often have to be liquefied in the wholesale establishments, and they will run over as soon as they begin to get heated; but if you put only 60 pounds in there is room for expansion; there is no trouble of that kind.

Mr. Sibbald: That is it.

Mr. Craig: A uniform package.

Mr. Couse: When you send an order out for 60 pounds what do you expect to get?

Mr. Sibbald: Sixty pounds of honey.

Mr. Couse: I would not expect to give it to you. So there would not be any understanding.

Mr. Sibbald: I do not think there are very many people but expect to give 60 pounds when they come to that, but I know there is a great deal of gross weights used in fives and tens, but in a 60-pound lot I never knew the man to be allowed the weight of his tin. The reason I put that question is this, I am down in Toronto handling a good deal of honey, and I know the wholesale men would handle honey on smaller margins of profit if it were less trouble to them. But if it is going to be a lot of trouble and require a lot of handling then they must have more profit. You take a man that sends down one hundred 60-pound tins. He has filled those tins just by guess, but perhaps he weighed the tins. Probably when he shipped the honey he weighed the whole thing again, and he has so many pounds in that lot and he sends it down to us, and he says, I am sending you down so much honey, without numbering his cans, and we get that honey in, how are we going to find out whether he sends that much or not? We do not know the weight of his crates; we have to go to work and uncrate every tin and we have to weigh every tin and get at it, and we have to mark the weight and gross weight on every tin. When we go to sell it out we have to go and take a list of all those weights, and they have to be added up and it makes endless trouble. We get orders like Mr. Couse says, "Send me a 60-pound tin of honey," and if the office people know we have tins with 60 pounds net in, they make the invoice out, and it is sent out without referring to the warehouse; otherwise we have to get the tin down and weigh it.

Mr. Shaver: I agree with my friend Sibbald. I took 1,500 pounds to Hamilton, and they just weighed three cans of the honey and they had no more trouble.

Mr. Brown: Mr. Sibbald is a very good authority on that because he handles quite a lot of honey.

Mr. Armstrong: I agree with Mr. Sibbald and with Mr. Brown. I have always been very particular in just putting so much in each tin. If it was a 60-pound tin I always put in 60 pounds; if it was a 10-pound tin I always put 10 pounds in.

Mr. Darling: I have a plate with the words "gross, tare and net" cut in it, and the cans are weighed first, and they are filled and weighed again and this is all filled out, and if I ship 1, 2, 3 or a dozen cans there is the invoice and every can has the gross and the net weight stencilled on it. I simply say to my customers, my cans hold so much, you can have the cans for so much net weight.

Mr. Chrysler: I agree with having a certain number of pounds. Say 60 pounds; it is so easily reckoned. I think it makes it more pleasant all around for the dealer.

Mr. Couse: What I meant more than anything else was to have a uniform understanding as to what was in the can. I certainly believe in a uniformity of honey in each package.

Mr. Evans: I think it would be much more satisfactory in dealing with the wholesale men if the 60-pound package should contain 60 pounds.

Mr. Roberts: I should think the proper way would be to put in the amount of honey that is ordered and charge extra for the tin.

Mr. Pickett: Would it not be better to have uniformity of action, both in can and weight?

Mr. Evans : I think so.

Mr. Frith : I have had experience in selling 60-pound cans, with the gross, tare and net weight of my honey, and it did not make any difference what the can would hold, simply put in 60 pounds, and I never had any trouble.

Mr. Sibbald : In connection with butter and cheese the tubs and packets are taken off and you get paid for nothing but the net weight. If your package costs you so much the only way you can do in that matter is to say, "Here, I must get 8 cents for my honey; my package costs me 3-4ths of a cent on that, therefore I must get 8 3-4 cents for my honey"; and then the man gets paid for his package, but he must put in the net weight of honey, and he can only get paid for that.

Mr. Robb : I had a little difficulty about this matter up in St. Thomas, and to make myself clear I went to the miller and the pork packer and asked those gentlemen what was their custom, and they said if you buy a barrel of pork you pay for the barrel, if you buy a barrel of flour you pay for the barrel. I said, if I ship honey to a firm in Hamilton do I charge them for the weight of the package extra ? He says, you charge them for the honey so much and so much for the package.

Mr. Sibbald : The ten-pound tins and the five-pound tins go right to the consumer, when it goes from the wholesaler and retailer, but the 60-pound tin is bought to weigh out again; but the ten-pound tins have a right to be paid for by the consumer.

Mr. Newton : I fully agree with the last speaker. I do not believe the bee-keepers should throw in tins gratis to anybody. They are branches of the business and charge for them in the same way.

Mr. Sibbald : I say when you sell a 60-pound tin of honey and you know the package costs three-fourths of a cent a pound, charge that for it. I am a wholesale man ; I buy 60 pounds from you ; I say I am going to get half a cent profit on the honey, and I can get 20 cents for the tin after I empty it, and I add that to my profit.

Q.—What is the best way to save combs carried over the season from moths ?

Mr. Brown : My method is to pile them up in empty supers and leave them outside all winter; let them get a good airing right along from the time they are taken off until they are required to be used the next season. Of course, if it were combs out of a hive that died out in the winter or in the spring they would be treated in a different way; then we have to examine them very carefully and fumigate with sulphur, or pick out with the point of a penknife when the moths make their appearance. I understand the question is with regard to extracting combs.

Mr. Craig : Bisulphate of carbon has come to be universally received as a preventive, as a remedy against moths in combs. I have tried it with the very best success possible. It is a simple and easy way. You either put them in a closed box or pile them up in supers, using say two or three ounces of bisulphate of carbon. This gas is heavier and of course descends, and for that reason you should put it on top. It destroys the vitality of the eggs as well.

Mr. Shaver : What sized moth will it kill ?

Mr. Craig : A moth any size from an elephant down.

Mr. Darling : I do not think we need be troubled very much with moths if our combs if we allow them to get a little frost in the fall, and then keep them shut away till next spring. You can keep them for five years. There is no moth will come through 20 degrees of frost, that is if the mercury drops down to 12 above zero.

Mr. Evans : I think the greatest difficulty is in the fall before the frost comes, taking them off the hives early.

Mr. Smith : Do not take them off.

Mr. Couse : How soon ?

Mr. Smith : Just take them off as soon as the cool weather begins—say in the middle of October.

Mr. Frith : In putting your combs away be sure they are about twice or three things the distance apart that they are in the hive, and, if you can, set them on two skids or scantling. This allows the spiders to get in amongst them and where the spiders get in you will have no moths.

Mr. Armsrong: My method is as soon as I find out the honey is all out of them I set them out in the yard. During the day there are no moths or millers flying and there are no eggs laid in the combs; then I am very particular in carrying my combs to my store-room and piling them up, and making them moth proof, and that is the way I have kept my combs from year to year. I never have them exposed over night, and I have never had the least trouble. I never lost two dozen of extracting combs since I started business.

Mr. Frith: I really think if we would adopt that formalin method it would be well to build a formalin box and formalize all your combs when you take them off, and I think it would be one of the best proofs against foul brood or black brood or anything of that kind. It destroys bacteria of every description.

Q.—Is there any safe way to increase faster than by natural swarming? If so, what is it?

Mr. Brown: I have never tried any other plan to any extent except by natural swarming; therefore, I am not an authority on it.

Mr. Sibbald: I think the best way is to keep your brood chamber intact as long as you can. Keep all the bees in one family; keep them all working along; you get far better results than to let them swarm, and at the same time you can take one frame of brood, first hatching the brood, put it in the hive, give them a queen cell, and you will soon have a colony started there; you can then add another one, and at the end of the season you can equalize them. You can increase almost as much as you like in the season, and it costs you nothing scarcely. You have kept your bees all working and your colony all together, and you have the full force all gathering surplus honey on that one stand while the other one is growing up. The brood we take out in the middle of the season would not be hatched and old enough to be in the field by the end of the season unless we have a fall flow.

Mr. Frith: When I was burned out with foul brood and lost all my bees, and I was anxious to build up very rapidly, I bought a colony in the spring, and I had twelve in the fall, and I did it just upon the same principle as Mr. Sibbald.

Mr. McEvoy: I wish to endorse what Mr. Sibbald said. In selecting this brood, I like to bring the frame above the queen excluder. Every beekeeper knows as well as I do that nine days after the egg is laid, if you take a frame of brood out somtimes it is not so readily done, and if it goes back there are quite a few of the young that are not fed as well as they might be. That can be done by selecting a frame out of the brood chamber that is nearly all full of larvae, that is not capped and take that to start the nucleus. On and after that Mr. Sibbald and I will go together.

Mr. Sibbald: I would do that only the two or three days you have that brood up there they will carry up any amount of pollen and store it in the next comb, too.

Mr. McEvoy: That would depend somewhat on the locality.

Q.—What is wrong with honey in the spring when the cappings burst and it runs out like water?

Mr. Brown: I consider it has been kept in an improper place; too damp and cold a place; the honey is sour and fermented and cold and that has been the cause of its bursting and running out.

Q.—Is there any advantage in shallow frames for extracted honey?

Mr. Brown: There may be, but I fail to see it. I have never tried a shallow frame, therefore I do not know much about it. I have tried the Langstroth frame and another called the Gallop frame. I think this question comes pretty nearly down to the Hedden hive—the question of which is the best hive. I cannot say there is any advantage except in a very poor flow of honey; there may be some advantage then.

Mr. Miller: I use the Hedden hive, shallow frame, and I find it is of just as much advantage in extracting as for comb honey. The supers are shallow, the frame is 5 3-8ths, and instead of handling the frames we set them off and allow the bees to go out and take in a full super. We never open the hive from the top and take them off and brush the bees off. We handle the whole super, 25 pounds; when it goes into the extracting room we find an advantage there when handling the hanging

frames. The frame is narrow; the knife passes the whole width of the frame quickly, there is no digging out of an unequal surface to uncap. And by having your extracting room arrangement complete you take the whole super into the extracting room and the super is set then beside the extractor and it is filled with one operation. We find in handling them for speed that they are a convenience.

Mr. Evans: Do you not find a lot of bees on those frames in carrying them in?

Mr. Miller: Possibly in the super there will be half a dozen or eight or ten bees which will at once fly to the screen, and no more trouble. We never think of brushing or removing a frame. Of course they are left on until they are capped; we tier up until the tops are ready to extract, or possibly take off two at one time.

Mr. Armstrong: I would like to ask Mr. Miller if he could handle sixteen frames out of the Hedden hive as quick as he could eight frames out of the Langstroth hives.

Mr. Miller: In the Hedden hive we get cases; 16 cases is exactly equal to ten frames of the Langstroth, and I may say yes and no; it depends on how you handle those sixteen frames. We handle them in cases, and we certainly can handle them more rapidly than you can handle your eight or ten Langstroth, taking the season through. It does not matter what stage of the season's work you are in, if you have sufficient Hedden hives that you have to have special short cuts you will find short cuts that you can adopt with this system of management, with hanging frames.

Mr. Armstrong: The point I wanted to get at was this: You have sixteen frames sitting alongside of the extractor, and you have got eight frames there. Which can you get the honey out of the quickest?

Mr. Miller: I can take them out of the sixteen while you are taking them out of the eight every time, because your surfaces are shallow and your knife passes more quickly over the comb.

Mr. Craig: Is there no advantage other than the matter of handling?

The President: The question simply says, is it any advantage for extracting?

Mr. Craig: Have they not any advantage further than in the matter of handling? Do you get any more honey with shallow frames?

The President: I can see one advantage: you get it riper. In a deep frame the top part is capped and the bottom is not.

Mr. Roberts: What method does Mr. Miller adopt to get rid of the bulk of the bees out of the super?

Mr. Miller: That depends on the season of the year, and what stage of the honey flow. If it is during the honey flow when the honey is coming in, we enter a yard and set off the supers that are full; pass down a row setting off the supers as quickly as we can pry up the cover and set the super down. Then the frames being solid, you can lift and handle them quickly as though they were board. We set it on end and leave them probably for half an hour or an hour till we get through the yard, then we commence and put those on a barrow and run them into the house; they are free from bees. If it is late in the season I use an escape under to take them out.

Mr. McEvoy: You will never get a better plan than Mr. Miller has now given for ready work.

Mr. Armstrong: Do you not find a number of young bees in these supers?

Mr. Miller: We do sometimes. We take the super and give it a sudden jerk and it will free almost every bee from it, as you go to put it on the barrow.

Mr. Craig: A quick, double shake.

Mr. Miller: Yes. The second jerk seems to remove them.

Mr. Armstrong: That is all right. You continue that all day and you will find that there is quite a shake.

Q.—Do bees leave their hives after being in the cellar if the windows are left open?

Mr. Brown: After they are put in the cellar and the window is left open, if they are put in anyways early I would consider they would come out and hardly find the road back again. If it is say the first of November or the middle of October I would certainly think they would get out and not get back.

Mr. Sibbald : I used to think that too, and Mr. Post told me last year that he never shuts a door or window; it is just like a shed in there, and I was quite surprised, but I tried it last fall, and I let the light come right in my cellar after I went home from the convention and the bees never stirred. And the reason I attribute to this, the bees at that temperature, just going in clean and nice from the yard, do not break cluster unless disturbed. In the spring if I did that I would find them on the windows quick. The windows are closed because I cannot go there every night to close them, but the doors are open. Unless someone goes in the cellar and disturbs them they will never break cluster.

Mr. Darling : There is no trouble with the bees in the cellar if they are properly put in, no matter how much light; you may let the sun shine in until the first of February; after that you have to keep it dark.

Mr. Brown : In a little article, Mr. A. I. Root in the "American Bee Culturist" says it has got to be as dark as night or else you will find trouble with bees getting out. I remember that Mr. Post said last year he had no trouble whatever, and it was I who put in this question, because I want to get it cleared up, and I would like to know all who have tried it and find the bees will not go out of the cellar to any exteut?

Mr. Smith : There is quite a difference in locality between Mr. Post and Mr. Hall, and very likely the temperatures are very different. You find where the temperature is kept low the bees have very little tendency to leave the hives, even when there is light.

Mr. Emigh : I am not very particular about closing up the windows in the fall; I do not set in very early. Of course, I want everything dark in the spring, but at this time of the year there are no bees going out to hurt anything.

Mr. Brown : I would like to set them in as soon as I could. It would be a little advantageous to do so. If we could set in during the month of October and feel that they would be perfectly safe then I would consider it would be a great advantage.

Mr Emigh : I used to be afraid to set the hives in if there was any snow on them or damp or anything; I was pretty sure I was going to lose something. I have got over that ; I am not a bit afraid of the hives being wet, and I do not care how much snow there is on them; in fact, if there is snow on I do not take it off, but push it up in front of the entrance, and they thaw themselves out when they get in the cellar, and those hives will dry off in the cellar.

Mr. Brown : I understand you practice leaving the windows and doors open. They would dry off much quicker that way.

Mr. Frith : My experience is very like Mr. Emigh's. I had a lot of bees to look after and I couldn't attend to them; I had three miles to move them and I went down in the sleigh and moved those bees all up into my own cellar, with six inches of snow, and my cellar is open ; I could make it dark, but I had a ventilator in it and I had a window opening into the other part of the cellar, and I never had bees winter as well.

Br. Brown : If the sun shines in through the windows ?

Mr. Frith : I woul not be afraid to have the sun shine in until it approached spring. I do not care if a few bees do get out.

Q.—What is the custom ? Do you weigh in the can when shipping ? That is supposing you have a 10-pound can do you weigh the can or put it in ?

Mr. Brown : I think that has been threshed out pretty well already. I will make the same reply I made to the other, put in 10 pounds.

After some discussion it was decided to send seven copies of Professor Fletcher's address of last year to each of the 100 members of the Association.

Mr. Smith moved, seconded by Mr. Holmes, that a very hearty vote of thanks be tendered to the Mayor and corporation of the City of Woodstock for the free use of their hall and the privileges accorded the Association. Carried.

The meeting then adjourned.

DIRECTORS' MEETING.

At a Directors' meeting following the annual meeting the following business was transacted :

Mr. Couse was reappointed secretary and Mr. M. Emigh treasurer.

The sum of $200 was appropriated to affiliated societies, no society to receive more than $20.00.

The usual grants of $25, $10 and $10 were made to the Toronto Industrial Exhibition Association, the Western Fair Association, London, and the Canada Central Exhibition Association of Ottawa, respectively.

The President, Vice-President, 2nd Vice-President, and Secretary were appointed an Executive Committee.

It was decided to give each member of the Association the Canadian Bee Journal for the current year.

The Executive Committee were appointed to get up a pamphlet on the uses of the Association, and have them distributed to beekeepers in the country, and also that a number of copies of a notice on spraying fruit trees while in bloom be printed and distributed among beekeepers in the Province.

The Executive Committee was directed to endeavor to have the word "full" struck out of the act in relation to spraying.

The matter of forming a guild was left in the hands of the Executive Committee.

The meeting then adjourned.

PAN-AMERICAN EXHIBITION, BUFFALO, N.Y., 1901.

Ontario Awards in Honey

Gold Medal.

Province of Ontario, collective exhibit of honey.

Honorable Mention.

Dennis Nolan	Newton Robinson	Extracted Clover Honey.
M. C. Beaupre	Simcoe	Extracted Clover Honey.
H. G. Sibbald	Claude	Extracted Clover, Basswood Honey and Comb Honey.
John Newton	Thamesford	Extracted Clover Honey, Comb Honey, Comb Foundation and Beeswax.
J. E. Holt	Newton Robinson	Extracted Clover Honey.
J. D. Evans	Islington	Extracted Raspberry Honey.
Samuel Wood	Nottawa	Extracted Clover and Basswood Honey and Beeswax.
Alex. Goodfellow	Macville	Extracted Clover Honey.
W. A. Chrysler	Chatham	Extracted Clover Honey, Comb Foundation and Beeswax.
George Wood	Erasmus	Extracted Raspberry and Willow Herb Honey.
John Pirie	Drumquin	Extracted Clover and Basswood Honey.
J. F. Switzer	Streetsville	Comb Honey.
H. D. McLaughlin	Vankleek Hill	Extracted Clover Honey.
James Armstrong	Cheapside	Extracted Clover and Comb Honey.
Geo. E. Saunders	Hornby	Extracted Clover and Basswood Honey, and Comb Honey.
Wm. Couse	Streetsville	Extracted Clover and Basswood Honey.
W. J. Brown	Chard	Extracted Clover Honey and Beeswax.
Geo. E. Johnson	Bracebridge	Extracted Clover Honey.
Robt. A. Smith	St. Thomas	Extracted Clover Honey, Comb Honey, Apiarian supplies and Honey Vinegar.
C. E. Gale	Ormstown, Que.	Extracted Clover and Comb Honey.

The above awards were granted in Division III, Taxidermy, Insects, and Insect Products.

BY-LAWS.

1. This Association shall be known as the Ontario Bee-keepers' Association, and shall be composed of those interested in bee-keeping who become enrolled as members by paying the annual membership fee of one dollar.

2. A general meeting of the members of this Association shall be held once a year, and shall be known as the Annual Meeting, the year to begin with the election of officers at such Annual Meeting and terminate on the election of their successors at the next Annual Meeting. At this Annual Meeting, or at any other general meeting of this Association, ten members in good standing shall constitute a quorum.

3. The time and place of holding the next Annual Meeting shall be fixed by the members present at the Annual Meeting.

4. The Board of Management shall consist of a President, two Vice-Presidents and nine Directors, elected one from each of the following twelve divisions :

Division No. 1.—Stormont, Dundas, Glengarry, Prescott and Cornwall.
Division No. 2.—Lanark, Renfrew, Carleton, Russell and Ottawa.
Division No. 3.—Frontenac, Kingston, Leeds, Grenville and Brockville.
Division No. 4.—Hastings, Addington, Lennox and Prince Edward.
Division No. 5.—Durham, Northumberland, Peterborough, Victoria and Haliburton.
Division No. 6.—York, Ontario, Peel, Cardwell and Toronto.
Division No. 7.—Wellington, Waterloo, Wentworth, Dufferin, Halton and Hamilton.
Division No. 8.—Lincoln, Niagara, Welland, Haldimand and Monck.
Division No. 9.—Elgin, Brant, Oxford and Norfolk.
Division No. 10.—Huron, Bruce, Grey and Perth.
Division No. 11.—Essex, Kent, Lambton, Middlesex and London.
Division No. 12.—Algoma, Simcoe, Muskoka, Parry Sound, Nipissing and Manitoulin.

Also one Director from the Ontario Agricultural College and Experimental Farm. The Board of Management so elected shall appoint from among themselves, or otherwise, a Secretary and a Treasurer, and shall also appoint at least three of their number as an Executive Committee.

5. Five members of the Board shall constitute a quorum.

6. Vacancies on the Board by death or resignation may be filled by the President, subject to the approval of the Executive Committee.

7. The officers of this Association shall be elected by ballot, with the exception of the Auditor, who may be elected by an open vote of the Association.

8. It shall be the duty of the President to preside at all meetings of this Association ; to call for reports ; to put motions when seconded ; to decide upon questions of order and to declare the result of ballots and elections. The President, in connection with the Secretary, shall have power to call special meetings when necessary. The President shall be ex officio chairman of the Board of Directors, and shall call it together when necessary.

9. In the event of the death or absence of the President, the Vice-President shall discharge his duties.

10. It shall be the duty of the Secretary to keep and preserve the books of the Association; to call the roll and read the minutes at every meeting of the Association; to conduct all correspondence of the Association; to receive and transfer all moneys received for fees and otherwise to the Treasurer, having taken a receipt for the same ; to make out a statistical report for the Association and for the Government ; to furnish the officers of the County and District Associations with forms for organization and annual reports, and to give notice of Association and Board meetings through the press or otherwise.

11. It shall be the duty of the Treasurer to furnish such securities for the moneys of the Association as the Board may determine ; to receive from the Secretary all moneys belonging to the Association and to give receipts for the same ; to pay them out on order endorsed by the President and Secretary, and to render a written report of all receipts and disbursements at each Annual Meeting.

12. Any County or District Bee-Keepers' Association in the Province of Ontario may become affiliated to this Association on payment of five dollars, which shall be paid to the Secretary on or before the first day of June in each year: but every local Association so affiliated must have on its membership roll at least five members who are also members of the Ontario Bee-Keepers' Association at the time of its affiliation, and must continue to have a like number of its members on the roll of this Association while it remains in affiliation.

13. Every affiliated Association shall receive an annual grant out of the funds of this Association. The amount of such grant shall be fixed by the Board from year to year.

14. All grants to affiliated Associations shall be expended in prizes for honey shows, or for shows of apiarian appliances, or for lectures on subjects pertaining to bee culture, or for advertising district or county meetings, or for any or all of these, and for no other purpose.

15. Every affiliated Association shall report to the Secretary of this Association (on a form to be supplied by the Secretary) before the first day of December in each year, which report shall be signed by the President and Secretary of the affiliated Associations.

16. County or District Associations seeking affiliation should forward to the Secretary an application according to the following form: "We, whose names are written in the accompanying form, having organized ourselves into a County (or District) Association to be known as County (or District) Association No. —, desire to become affiliated to the Ontario Bee-Keepers' Association, and we agree to conform to the Constitution and By-Laws of said Association."

Form of application as follows:

Names of those already Members of O. B. K. A.	P.O. Address	Fees.	Names of those not already Members of O.B.K.A	P.O. Address	Fees.	Remarks

17. Every affiliated Association that neglects or refuses to pay the annual affiliation fee, or neglects or refuses to forward to the Secretary the annual report on or before the date fixed, may be deprived of their affiliation privileges by the Board.

18. Should an affiliated Association become defunct after the payment to it of the grant from this Association, any unexpended balance of said grant shall be forfeited and paid over to the Treasurer of this Association.

19. Each affiliated Association shall be entitled to the privilege of two representatives at the meetings of this Association in addition to those who are already members of this Association, and such representatives shall be entitled to all the rights and privileges of members of this Association.

20. Every delegate from an affiliated Association shall furnish to this Association a certificate, signed by the President and Secretary of the body which he represents, showing that he has been duly appointed a delegate of such Society.

21. Each affiliated Association shall be entitled to the services of an Association lecturer (when such exists) once in each year, half the expenses connected with such lecture to be borne by the District or County Association and half by this Association.

22. The order of business by which the meetings of this Association shall be governed shall be in the discretion of the President, but subject to appeal to the meeting when objection is taken, when a majority vote of the members present shall decide on the objection, and in such cases the vote of the majority shall be final.

23. These By-Laws may be amended by a majority vote of the members present at any Annual Meeting, or at a special meeting of the members called for the purpose of considering the same, and of which at least two weeks' notice shall be given by public advertisement.

ANNUAL REPORTS

OF THE

POULTRY ASSOCIATIONS

OF THE

PROVINCE OF ONTARIO,

1901.

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE.)

PRINTED BY ORDER OF

THE LEGISLATIVE ASSEMBLY OF ONTARIO.

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1902.

WARWICK BRO'S & RUTTER, Printers.
TORONTO.

THE POULTRY ASSOCIATION OF WESTERN ONTARIO.

OFFICERS FOR 1902.

Honorary President	F. W. Hodson	Ottawa.
President	A. W. Tyson	Guelph.
1st Vice-President	W. McNeil	London.
2nd Vice-President	M. T Burn	Tillsonburg
Secretary-Treasurer	A. P. Westervelt	Toronto.
Auditor	J. M. Duff	Guelph.

Directors:

James Dundas	Deer Park.
John Crowe	Guelph.
J. S. Jeffrey	St. Catharines.
Thos Scott	St. Thomas.
John Ramsey	Owen Sound.
Allan Bogue	London.
W. Kedwell	Petrolia.
W. J. Bell	Angus.
W. R Graham	Guelph.

Delegates to the Industrial Exhibition, Toronto	W. Barber	Toronto.
	W. Fox	Toronto.
" *Western Fair*, London	J. H. Saunders	London.
	Wm. Beattie	Wilton Grove.
" *Winter Fair Board*	Wm. McNeil	London.
	A. W. Tyson	Guelph.
" *Central Fair*, Hamilton	R. McKay	Hamilton.
	G. C Henderson	Hamilton.
" *Southern Fair*, Brantford	T. A. Cox	Brantford.
	W. Colwell	Paris.

FINANCIAL STATEMENT.

Receipts.		Expenditure.	
Special prizes	$140 00	Judges' fees	$140 00
Membership fees	196 00	Work at Poultry Show	56 50
Entry fees	968 35	Feed	16 99
Legislative grant	1,000 00	Prizes paid	1,432 00
		Special prizes	140 00
		Printing	11 00
		Cash paid Owen Sound	75 00
		T. A. Browne, amount loaned Association	100 00
		Secretary's salary	150 00
Total	$2,304 35	Total	$2,121 49
		Balance on hand	182 86

Examined and found correct, this 25th day of November, 1901.

H. B. Donovan, Auditor.

A. W. Tyson, President.
A. P. Westervelt, Secretary.

Name and Address.	Variety entered.
Argyle, L., Rockwood	Silver Wyandottes.
Arthur, Jas., London	Silver and white Wyandottes.
Auld & Auld, Eden Mills	White and Barred Rocks.
Andrew, Thos., Pickering	Part Cochins, Barred and Buff Rocks.
Armstrong Bros, Fergus	Pigeons.
Baulch, Jos. H., Port Hope	White Rocks.
Bessey, W. H., Coleman	Turkeys.
Beattie, W. H., Wilton Grove	S. C. Br. Leghorns.
Beckers, H. F., Waterloo	White Rocks and Ducks.
Bettschen, F., Palmerston	Games and Game Bantams.
Barber, Wm., Toronto	White Wyandottes.
Baldwin, L. H., Deer Park	Barred Rocks.
Bennett, J. E., Toronto	Game Bantams.
Bertie, Jas., "	Buff Rocks
Bawden, Jno., Ridgetown	Games and Ducks.
Beonett & Pardo, Charing Cross	White Rocks and Black Leghorns.
Brown, A. G., Watford	Orpingtons.
Brewster, E. W., Compton, Que	Turkeys.
Beattie, A., Wilton, Grove	R. C. White Leghorns, Turkeys and Geese.
Bell, W. J., Angus	Golden Wyandottes.
Barr, J., Woodstock	Buff Leghorns.
Berner, G., Toronto	Langshans, Javas, Leghorns, Game, Bantams, Polands, Geese, Ducks, Pigeons and Pheasants.
Burn, M. T., Tillsonburg	Brahmas, Cochins, Hamburgs, Dorkings, Polands, Games. [Geese and Ducks.
Bogue, Allen, Woodbank	Wyandottes, Javas, Dominiques, Spanish, Red Caps, Dorkings, Polands, French and Ducks.
Barber, R. H, Guelph	Barred and White Rocks.
Bogue, G. J., Strathroy	Barred Rocks and Dressed Poultry.
Brown, J. B., Listowel	Ducks.
Bowman, Jas., Guelph	Dorkings and Turkeys.
Bruce, S., Hamilton	Game Bantams. [Indian Game.
Colson, Jno, Guelph	White Rocks, White and Golden Wyandotte, and
Cullis & Lean, Powell's Corners	Plymouth Rocks, Wyandottes, Spanish, Andalusians and Bantams.
Crowe, Chas. R., Guelph	R. C. Br. Leghorns and Orpingtons.
Carroll, Jas. A., London	Bantams, Games, Turkeys, Geese and Ducks.
Carling Bros., Exeter	Golden and Buff Wyandottes.
Cadman, Wm, St. Thomas	Games.
Colwell, Geo., Paris Station	Barred Rocks and Eggs.
Cann & Daniel, Plattsville	Barred Rocks, Buff, Wyandottes and Andalusiana.
Crowe, Jno., Guelph	Buff Leghorns.
Campbell, W. J., Snelgrove	Dressed poultry.
Cosh & Co, N, London	
Cornwell, N. K., Thamesville	Bantams, Pheasants and Pigeons.
Clark, J. N., Onondaga	Buff Leghorns and Buff Wyandottes.
Chamberlain, Geo., Guelph	Incubators, Plymouth Rocks, Wyandottes, Javas, Leghorns, Red Caps, Games and Orpingtons.
Donovan, H. B., Toronto	S. C. Br. Leghorns.
Dundas, Jas., Deer Park	Wyandottes.
Daniels, C. J., Toronto	Black Langshans.
Dawson, W. J., "	S. C. Br. Leghorns.
Dorst, J., "	Games.
Dewey, E. J., "	Black and White Cochins.
Durstan, R., "	Buff Cochins, White Rocks and Bantams.
Dewar Bros., Milton	White Rocks.
Earl, E. F., "	Rabbits.
Emrich, H., Bridgeburg	White and Buff Rocks. [shans.
Eisell, C. J., Guelph	Game Bantams, Dorkings, Orpingtons, and Lang-
Elliott, Wm., Oshawa	Black Minorcas.
Fox, Wm., Toronto	White Rocks and Orpingtons.
Forster, Mrs. W. R., Brampton	Barred Rocks.
Furminger, S. D, St. Catharines	Dressed Poultry.
Frith, E. R., Maxville	Dominiques.
Frith, S. W., Winchester	Brahmas, S. C. White Leghorns and Turkeys.
Fyfe, W. C., Montreal West	Black Leghorns.
Fyfe, Geo., Gourock	
Fink, A., Woodstock	
Gould, Chas. D., Glencoe	
Grundy, Joseph, Guelph	

List of Members.—*Continued.*

Name and Address.	Variety entered.
Gow, Geo., Fergus	Barred Rocks.
Graham, A. W., St. Thomas	Golden and Buff Wyandottes.
Goldie, R., Guelph	Ducks.
Greenfield, W. A., Plattsville	
Goldie, Nellie C., Guelph	Dark Brahmas.
Gracey, R. J., Wellandport	White Wyandottes and R. C. Br. Leghorns.
Grogham, Rev. Thos., Hamilton	
Good & Harron, Berlin	Leghorns and Black Minorcas.
Henderson, G. G., Hamilton	S. C. Br. Leghorns. [Leghorns.
Hertel, C., Hanover	Golden and White Wyandottes and R. C. White
Hill, J. F., Welland	Black Langshams, [Orpingtons.
Heaven, C. C., Oakville	Barred Rocks, Buff and White Wyandottes and
Hales, E. A., Guelph	Barred Rocks, Indian Game and dressed poultry.
Harmer, Ed., Westboro	Orpingtons.
Hancock, C. R., Chatham	Barred Rocks.
Henry, Robert, Guelph	Pigeons.
Hammill, Wm., Toronto	Game Bantams.
Innes, John, Rockwood	White Rocks & A. O. V. Fowls.
Iousin, G. A., Ingersoll	Buff Rocks. [Wyandottes.
Jeffery, J. S., St. Catharines	Barred Rocks, S. C. White Leghorns and White
Jefferies, E., Toronto	Buff Leghorns.
Knight, I. T., Guelph	Barred Rocks and Ducks.
Kennedy, J. F. N., Agincourt	White Rocks. [A. O. V. Fowls.
Kinder, G. W., Strathroy	Barred Rocks, Silver Wyandottes, Red Caps and
W. K. Kerr, East Toronto	Orpingtons.
Kilsy, S. J., Aylmer	Black Wyandottes, Javas and Bantams.
Kirby, S., Woodstock	White Rocks and Wyandottes.
Karn, H., Guelph	Black Langshams.
Kingsmill, T. F., London	White Wyandottes.
Kettlewell, N. T., "	White Wyandottes.
Knight, W. R., Bowmanville	Silver Wyandottes, Javas, Black Leghorns, Spanish, Andalusians, Turkeys and Ducks.
Kedwell, John, Petrolea	
Lowrie, D. A., Brussels	
Luxton, A. G. H., Milton	Dominiques and Turkeys.
Ludwig, L., VLondon	Pheasants.
Latta Bros., London	Cochins.
Lemon, W., Lynden	Golden and Silver Wyandottes.
Langelier, G. A., Quebec	Dark Brahmas and Black Langshans.
Magill, J. H., Port Hope	Golden Wyandottes and Pigeons.
Millard, R. B., London	Barred Rocks and White Wyandottes.
Mueller, Chas., Waterloo	S. C. Br. Leghorns.
Millard, I. K., Dundas	Barred Rocks.
McKee, Jas. H., Norwich	
McKee, Jno., Norwich	S. G. Dorkings.
Monroe, Hugh, Marden	Black Minorcas.
McCurdy, R., London	Black Langshans.
McNeil, Wm., London	Hamburgs, Polands, Bantams and A. O. V. Fowls.
McDougall, A., Milton	Turkeys and dressed poultry.
McDonnell, F. P., Watford	Black Wyandottes.
McPhie, N. D., Hamilton	Pigeons. [Ducks.
McCormack, J., MRockton	Barred Rock, Game Bantams, Dorkings, Geese and
McLoud, Wm., London	Barred Rocks.
McGiverin, H. T., Galt	White Rocks. [White Leghorns.
McKay Bros., Clachan	Barred and Buff Rocks, Buff Wyandottes and S. C.
Minshall, J. H., Brantford	Black Minorcas.
Munroe, E., Goderich	Black Wyandottes.
Masson, Jas., Woodstock	R. C. White Leghorns.
Modlin, Jno., Hamilton	Indian Game.
Morley, Jas., Milton	Black Breasted Red Game.
Meyer, J. E., Kossuth	Incubators, Buff Rocks and Silver Wyandottes.
Massie, Chas., Port Hope	White Wyandottes and Pigeons.
Newton, Rev. W. L., Norwich	
Nahrgang, G. W., Palmerston	Pigeons.
O'Neil, Jas., Toronto	White Minorcas.
Oakwood Farm, Toronto	Game Bantams.
Oke, R., London	Partridge Cochins, Black Wyandottes, Javas, R. C. W. Leghorns, Hamburgs, Bantams and French.
Oke & Andrews, London	White Rocks.
Pollock, W. E., Norwich	Barred Rocks and S. C. Br. Leghorns.
Parsons, J. H., Osaca	Indian Game, Buff Rocks and dressed poultry.
Pickard & Cullen, Drumbo	Light Brahmas, White Wyandottes and Hamburgs.

List of Members.—*Continued.*

Name and Address.	Variety entered.
Paine, Geo., Aldershot	Golden and White Wyandottes.
Patten, A., London	Dark Brahmas, R. C. W. Leghorns and Games.
Plunch, Jno., Shakespeare	S. C. White and Brown Leghorns.
Philpott, Jno., Guelph	Games.
Pfaff, A., Guelph	White Langshans and R. C. Br. Leghorns.
Roos, P. H., Waterloo	Buff Leghorns and Orpingtons.
Ramsay, Jno., Owen Sound	S. C. White Leghorns.
Roberts, J. W., St. Thomas	Black Red Game.
Rife, W. A., Hespeler	R. C. White Leghorns.
Ross, Mrs. J. T., Hamilton	White Dorkings and Silver Wyandottes.
Readwin, A. & T., Guelph	Black Langshans, Buff Rocks, Silver and Buff Wyandottes.
Richardson, C. M., Toronto	Barred Rocks.
Rice, Thos., Whitby	White Rocks, S.C.W. and Br. Leghorns.
Smith, C. E., Scotland	Geese and Ducks.
Saugeen Poultry Yards, Durham	Javas, R.C. Br. Leghorns and Turkeys.
Shea, Thos. M., Fergus	Turkeys and Geese.
Sage, L. C., London	Brahmas and Game.
Stewart, A. D., Galt	Buff Wyandottes.
Scranton Bros., Ennotville	Barred Rocks, Turkeys, Geese and Ducks.
Saunders, R. H., Ealing	Golden Wyandottes.
Shales, Mrs. J. H., Toronto	Buff Rocks, Buff and White Wyandottes, Black Minorcas and Game Bantams.
Spry & Mick, "	Buff Leghorns.
Sunley, Thos., Guelph	Canaries.
Snyder, E., Burgessville	Barred Rocks.
Saunders, J. W., London	Buff Wyandottes, Games and Pigeons.
Saunders, S., Guelph	Buff Rocks.
Sallows, H., "	Games and Canaries.
Sheridan, T. J., Oshawa	Light Brahmas and S.C. Br. Leghorns.
Stewart, C. A., London	Buff Cochins.
Scott, T. H., St. Thomas	Buff Rocks, Buff Wyandottes and A.O.V. Fowls.
Stagg, W. C., St. Catharines	Barred Rocks.
Taylor, J. G., Woodstock	S.C. Br. Leghorns.
Teale & Co., W. J., Guelph	Games, Bantams, Houdans, Ducks, Pigeons and dressed poultry.
Tozer, H., London	R C. Br. Leghorns, Buff Cochins, Hamburgs and Bantams.
Trew, T. C., Lindsay	Barred Rocks and Houdans.
Tyller, W. H., Guelph	Pigeons.
Tilt, C. A. R., Doon	Dark Brahmas, Black Langshans, Ducks and Geese.
Tyson, A. W., Guelph	Game Bantams aad Canaries.
Thompson, Jno., Fergus	Light Brahmas and Bantams.
Traplin, Thos. H., Hespeler	Buff Wyandottes and Orpingtons.
Templin, J. C., Fergus	Light Brahmas and Buff Cochins.
Thorpe & Scott, London	Brahmas.
Tossy, Geo. A., Hamilton	Light Brahmas.
Thomson, A., Allen's Corners, Que.	
Tomalin, J., Deer Park	Dressed poultry.
Vance, Geo., Woodstock	Pyle Game.
Wyatt, H., London	Light Brahmas and Cochins.
Wright, W. E., Glanworth	Spanish, Red Caps and Turkeys.
Whitworth, F. W., Guelph	S.C. Br. Leghorns and Spanish.
Wolfe & Mason, Toronto	S C. White Leghorns.
Wood, E., Freeman	White Rocks.
Walker, Jas., Fergus	Barred Rocks.
Whitesell, Geo., Ridgetown	White Rocks and White Wyandottes.
Wixson, F., Ingersoll	S.C. W. Leghorns.
Whelans, Geo., Toronto	Buff Leghorns and Buff Rocks.
Wicks & Son, E., Mt. Dennis	Houdans and Orpingtons.
Walker, Wm. R., Guelph	Light Brahmas.
Webber, Chas. S., Hamilton	Black Cochins.
Wagner, Chas. F., Toronto	Orpingtons.
Wright, Fred., Listowel	Barred Rocks.
Washburn, Fred., Guelph	Andalusians and Ducks.
Wilson, M., Fergus	Barred Rocks and Cross-breds.
White, Geo. J., Hamilton	Partridge Cochins, S. G. Dorkings and Pigeons.
Wilson, W. C., East Oro	Partridge Cochins, Barred Rocks, R C. Br. Langshans, S.G. Dorkings and Houdans.
Wedgery, Jas., Woodstock	Black Wyandottes.
Wallbridge, G., Oakville	
Zavitz, L. V., Toronto Junction	Black Minorcas.

POULTRY ASSOCIATION OF WESTERN ONTARIO.

ANNUAL MEETING.

The annual meeting of the Poultry Association of Ontario was held in the Council Chamber, Guelph, December 12th, 1901, at 1.30 p.m., the President, Mr. A. W. Tyson, in the chair.

The minutes of the last annual meeting were adopted, after which the Secretary read his report.

REPORT OF SECRETARY.

The past year has been a very successful one for the Ontario Poultry Association. The year began with a debit of $100. It ended with $182.86 to the credit of the Association. The amalgamation with the Provincial Winter Fair has worked out very successfully. A large number of people have been reached by this means who could not have been induced to attend a poultry show with no other connection. To this arrangement is due in a great measure the financial condition of the Association at the present time. As nearly as we can figure, up to the last evening between six and seven thousand people have visited the Winter Fair, and there are very few of that number who have not visited and taken a special interest in the poultry department. This not only advertises the poultry, but also shows to the public what good is being done through the Poultry Association.

This year the Minister of Agriculture increased the grant to the Poultry Association to one thousand dollars to assist in carrying on the educational features in connection with the show.

The Department of Agriculture also supplied for the present show, five hundred additional wire coops, a number of tables required for holding the coops, also some tin drinking cups. In this connection I think we should thank Mr. John Saunders for his work in obtaining these very necessary appliances, also for the exceedingly good manner in which he has performed his work in the poultry department. I think it would also be proper if a motion were passed thanking the Minister of Agriculture for the very liberal manner in which he has supplied funds for the equipment of the poultry building.

The Committee appointed at the last annual meeting to take charge of poultry experiments, made arrangements with Mr. Graham, of the Ontario Agricultural College, to conduct the experiments this year. The results were given by Mr. Graham at the meeting on Thursday, December 12th. They will be published in the annual report.

At the annual meeting it is expected that the members will give expression to their views for the guidance of the newly appointed Board of Directors. Any criticism made should have the object of improvement in view, and I believe it would be wise if there should also be coupled with it a suggestion as to how the matter referred to could be improved.

Mr. F. W. Hodson, Live Stock Commissioner, laid a plan before the Minister, which was acceded to by him, of dividing Ontario at Toronto, and increasing the grants to the Poultry Association. This plan was also submitted at the last annual meeting and accepted by the Association.

In conclusion, I wish to thank the officers and directors for the assistance rendered to me in carrying out the work of the Association during the year just past.

A. P. WESTERVELT, Secretary.

With regard to this matter the following letter was received from the Deputy Minister of Agriculture. You will notice it is suggested in this letter that the Board of Directors be reduced to six. If Division No. 6 is dropped and Ontario County taken

out of Division 7, it would give us still eight directors, and I think would be satisfactory to the Department, and suggest that the division be made in this way:

Dear Sir,—For the election of Directors of the new Western Poultry Association two plans are hereby submitted:

(1) Take districts 6, 7, 8, 9, 10, 11 and 12 as they stand in the Agriculture and Arts Act and elect one director for each. This is the plan I suggested to the President.

(2) Take the eastern part of Ontario, that is all the counties west of and including York and Simcoe and subdivide or arrange them as the Society sees fit for representation. Half a dozen directors in addition to the President and Vice-President should be sufficient.

In the first case you would take in Ontario County and York and all west of these (Simcoe, Muskoka, etc., being with the east). In the second case your eastern line would be the eastern boundaries of York and Simcoe.

Either proposition will be satisfactory to the Department. Let the Society or the present directors adopt either and act upon it, and we will frame the amendment to the Act accordingly.

The Act also permits the Society to elect as an extra director any official of the Agricultural College. Yours very truly,

(Signed) C. C. James,
December 11th, 1901. Deputy Minister of Agriculture.

It was moved by Mr. Anderson, seconded by Mr. Mick, that the report be adopted as read with suggestions. Carried.

It was moved and seconded that the report of the Treasurer be adopted as read. Carried.

The Secretary read a suggestion regarding the Constitution and By-laws of the Association. See page 69.

It was moved by Mr. McNeil, seconded by Mr. Teale, that the Constitution and By-laws be accepted as read.

Moved as an amendment, and seconded, that the clause regarding proxy votes be struck out and that there be a 2nd Vice-President. Carried.

With this amendment the original motion was carried.

It was moved by Allan Bogue, seconded by M. T. Burn, and carried, that a vote of thanks be extended to the Honorable the Minister of Agriculture for Ontario, for the very liberal manner in which he has always supported the Poultry Association in Ontario, as well as for the increase in the grant and for the additional fitting supplied for the poultry department of the Winter Fair.

The meeting then adjourned.

DIRECTORS' MEETING.

Immediately at the close of the annual meeting the newly elected directors held a meeting.

It was moved and seconded that Mr. J. M. Duff, Guelph, be appointed auditor. Carried.

Mr. McNeil and Mr. Donovan were appointed a committee to have the constitution and by-laws printed.

Moved by Wm. McNeil, and seconded by Mr. Scott, that the prize list be revised, and that the list of specials be in the hands of the Secretary by the 15th of October. Carried.

It was resolved that a class for Cayuga ducks be aded to the prize list. Also that a class be added for China geese and Japanese Silkies. It was also resolved that the class for Belgian canaries be changed to read, "Scotch Fancy Canaries."

It was moved by W. McNeil, and seconded by M. T. Burn, that the entries close two weeks before the show is held, and that an official catalogue be printed; also that the names be left off the coops. Carried.

The meeting then adjourned.

REPORTS ON POULTRY EXHIBITS AT WINTER FAIR.

By Sharp Butterfield, London.

Light Brahma Class, 52 in number, I think was easily the banner class for Light Brahmas, either at Toronto or any other Canadian show, and birds of exceptional merit found their way to the Red Ribbons.

Dark Brahmas. I may say the same of them, for, in my 28 years judging, I never met as many Light and Dark Brahmas at our Ontario show; and among the Darks were the birds that got all the first prizes at the Pan-American, so we had lots of quality as well as quantity.

Buff Cochins were not so strong as usual, partly caused by a depression for about two years, but, to-day, they are becoming higher than any other breed.

Partridge Cochins contained some very fine specimens, but, being very difficult to breed, they are not so popular as the Buffs, White and Blacks.

Langshans, a very strong class, and especially good in quality and condition, alone would change a great many of the prizes, so nearly equal were the birds.

Barred Plymouth Rocks. The best and most of them that ever met in Canada, 154 in number, a class large enough of itself for one judge to get through his work in a day. The Barred Plymouth Rock is pre-eminently the general purpose fowl, though other birds have their admirers; but, in the United States and Canada they are a long way in the majority as a utility fowl, and we may safely say that there was probably nearer $2,000 than $1,000 of value in that one breed alone.

Buff Rocks were not as large in number as last year, but they made up in quality; and, to look back only a few years, there was not a Buff Rock shown that would be considered a good bird now, so much progress has been made in so short a time, it is almost marvellous.

White Rocks. Nearly 20 more in number than last year; a grand class of birds, 75 in number, and birds so full of merit, that there was but slight difference between those with the cards on their coops and those without.

Buff Wyandottes made a class of very highly meritorious birds, and first cock was a gem of the first water, being full of quality, both in color and shape. First and second cockerels and first and second pullets were also extraordinary specimens. Buff Wyandottes have come to stay.

Buff Leghorns, 46 in number, and not an ordinary specimen in this class, but all birds of very high merit, and this and most of the classes I acted upon, were larger classes than is met even in New York or Boston, and quality equal to the best shows on this continent.

Games and Game Bantams were well represented, and scarcely an inferior bird in the whole of the classes.

Indian Games contained some grand specimens and the winning birds good enough for any competition.

Ornamental Bantams were a show by themselves, consisting of specimens of the kind that can, and do the winning at American shows.

White Cochin Bantams brought out some of the finest specimens yet produced, while, in nearly every variety of Bantams, there were specimens easily worth their weight in silver, and some of them nearly in gold. Taking the classes I judged, I can truthfully say they contained more high-class specimens than I ever met before.

By T. H. Smelt, Woodstock

Black Minorcas. Winners were all good sized birds, but an exhibit sent by Mr. Minshall, and which arrived too late for competition, was exceptionally good.

White Minorcas. First cock well stationed, typical in shape; first and second hen both A1 in quality, good young birds; first cockerel better matured than second, and same answers for the pullets.

Andalusians. First cock probably the finest ever shown here, and first hen just

as good; winners of second and third very little behind first, and same can be said of the young stock.

Golden Spangled Hamburgs. Entry small but comparatively good; winners of first and second were better on head points, extra good style and spangling.

Silver Spangled Hamburgs. Small entry in old birds, not up to former years; young birds better; first cockerel best ever shown in America; pullets also good; first a little better spangled than second.

Golden Pencilled Hamburgs. Small entry, but A1 quality; first cock won on account of best conditon; first cockerel won easily, being extra good in lobes and tail, and good, even color.

Silver Pencilled Hamburgs. First cock deserves special mention, fine in tail points and head; third cock close up to first and second; first cockerel a very stylish bird, with perfect Hamburg shape, almost perfect tail, nice head and lobes, won easily; second a good one; first pullet beautifully pencilled, good hackle and nice style; second lacked in breast pencilling.

Black Hamburgs. First cock I consider the best ever shown here, comb and lobes extra fine, grand shape and color; second a good one; first hen deserves all that could be said of her, she is an old time winner, probably the best this country has ever seen, has a rich, clear, green sheen that is unsurpassed; first cockerel a typical Hamburg, lacks slightly in comb; second a good one, off in lobes, not quite as stylish as first; winning pullets all choice.

Red Caps. There was little choice among the winners, quality being extra good all through the class.

Houdans were a large class; first cock and hen fine in shape, beautiful crest and beard and good in color; second bird close, not quite so good in shape as first; first cockerel typical Houdan in every way, good color, crest and beard, wins easily; second also good, very little behind first, lacks in crest and beard; third close up to first pullet, good in color; other winners not far behind.

Creve Coeurs and La Fleche were nice classes, all good both old and young.

Sultans. Quality not as good as former years; winners fair.

Dominiques show improvement over other seasons, and competition was keen.

Black Javas were good; special mention might be made of first cock and hen.

Mottled Javas were an improvement over former years; the two birds deserving particular mention first cockerel and first pullet.

Black Spanish were a large entry, but the birds show a falling off in some points, particularly in face, which is too small, and too rough; first cock and hen were really good ones; first pullet nice in face but not fully matured.

White Wyandottes were a very large class, far ahead of any former years. Competition was very close, but first cock stands prominently above the others as an almost perfect type of Wyandotte; second and third lack in shape compared with the first, and not as clear in plumage; winning hens in such a strong class were necessarily good; first cockerel hardly up to first cock, but an extra fine bird all through; second and third good enough to win in strong competition; first and second pullet two grand birds; the rest of the class, which had to go unplaced, were fit to win in any ordinary competition.

Golden Wyandottes, made a fine showing and not a poor bird in the lot; first cock a magnificent bird, I consider the best I ever handled, or ever shown in Canada; the hackle and saddle were the same shade of color, beautifully pencilled, he won easily; second cock lacks in shape and color, with the third close up; first cockerel grand in head and shape of breast; second and third well worthy of the premiums; first pullet, a gem, grand shape, well-laced breast, good wing and rich color; second very nice, not quite as rich in color, but good shape; third close up, and a lot of good ones left out.

Silver Wyandottes. A large class and all good ones; the first cock and the first pullet perhaps being the gems: first pullet lacked in neck, but strong otherwise.

Black Wyandottes. As a class were more plentiful and better than usual, the quality being gilt-edged all through. It was close running for the honors.

Orpingtons were a surprise in both numbers and quality. This new English general purpose variety has quickly had its merits recognized by both the fancier and market producer, and that the breed fully deserves its rapidly acquired favor, was well shown in the extremely meritorious class seen at the "Ontario." In color the Buffs already equal the older Buff breeds, and their heavy bone and large size are great points in their favor. I consider them the coming utility fowl, especially fitted to supply the British market. The winners of first in cock, hen, cockerel and pullet, were all grand birds, with good ones in second place, and plenty of choice specimens left out.

In speaking of the A.O.V. Class I must say that I find it impossible to do justice in placing the awards. Where several varieties are shown it sometimes happens that the newer varieties, with birds of excellent quality, compete with birds of standard varieties of only medium quality. In this case, of course, the standard breed wins over birds of better merit in their own class. This year the winnings in the A.O.V. Class were divided mostly between Silkies and Anconas, while there were breeds represented of probably more merit, which, because they are not yet admitted to the Standard, had to be left out.

In the cross-bred fowl class some very useful crosses were represented, the winner being a cross between Indian Game and Golden Wyandottes. This bird retained the plump breast of the game, and had size of bone added by the Wyandotte blood. The cross appears to be a successful one to produce good market poultry; second in class a White Plymouth Rock and White Wyandotte cross; hardly has the breast development of first, though the color might be in its favor to make cleaner looking carcass; third was too light in weight, and color was much against it.

RESULTS OF EXPERIMENTS AT DOMINION CHICKEN-FATTENING STATIONS.

By F. C. Hare, Chief of Poultry Division, Dept. of Agriculture, Ottawa.

In listening to the addresses last night I was pleased to hear the speakers say that the farmers are the backbone of this country and as such deserve every help and encouragement from the several Governments. Through the agency of the poultry experiment stations operated by the Dominion Department of Agriculture, we are noticing throughout the country that the farmers are recognizing the importance of fattening their chickens for market, are using more care in dressing their chickens for [illegible] and are also breeding from a better class of chicken. The other day I visited some farmers near Montreal who are shipping their chickens to that centre and are receiving 11 cents per pound for them. These are the ordinary farmers' chickens, the large majority being pure bred or grade Barred Plymouth Rocks, simply fatted for four weeks in crates and shipped to Montreal twelve in a box. There is no work connected with this business that the average farmer cannot attend to.

Then in regard to the English market, I am sure that we are all glad to learn that the poultry exports increased eleven times between 1896 and 1900. That is a greater increase than is shown by any other farm product that is being shipped to the old country. Butter is the only competitor poultry has in its remarkable growth, and the butter exports have increased four times in that period. I believe that this year the poultry exports will double what they were last year. What is the reason for this rapid growth in our poultry exports to Great Britain? The buyers in Canada are well pleased with the prices they are receiving in Great Britain and the English consumer has a growing fondness for fatted Canadian chickens.

Now as to the illustrative poultry work the Department is doing. It is evident that in order to achieve the greatest success the farmer should receive accurate information, help and encouragement at his own door. He should be able to see how the actual work is done, and also have access to any information he might desire. This is exactly what the Department is trying to accomplish at our illustrative

poultry stations. For example, there are five of these illustrative poultry stations in Ontario. At each station the work is carried on by a farmer, and in this way the farmers of the neighborhood by simply visiting the station and seeing the actual process of hatching, rearing, fattening and marketing the chickens, can secure accurate and positive information about every detail of the work.

That these stations are accomplishing the object intended is undeniable. In every locality in which a station has been operated not only has the quality of the chickens been greatly improved, but the prices realized by the farmers have advanced.

There is no doubt that there is a large, profitable market in Canada for a good quality of chickens. In the first place we have the large centres of population, where specially fatted chickens bring greatly increased prices ; then there is the rapidly growing number of exporting firms who desire fatted chickens to export to Great Britain. These firms buy the chickens alive from the farmer, paying expressage and all transportation charges, so that to supply this trade the farmer has simply to rear his chickens to four or five months of age, fatten them and sell them.

For chickens of good quality the British market is unlimited. We have never been able to supply their demands, and we never can, simply because as our poultry exports increase we will drive the poor stuff off their market. I read a report recently from one of the Liverpool poultry dealers. He said that Canadian chickens were arriving in very fine condition and in fact were even now driving the poor Irish poultry and continental stuff off the market, because of the uniform quality of the Canadian chickens, which uniformity pleases the Englishman. So that there is room for a great and profitable export business with Great Britain in chickens. What the English buyers want are chickens with a plump, meaty breast, a white skin with a fine-grained flesh, small bone, minimum quantity of offal, and that they are neatly dressed and packed for market. For this quality of chicken they will pay from 14 to 16 cents a pound in England, or which corresponds to 13 to 15 cents a pound in Montreal.

The Dominion Department of Agriculture started three illustrative stations last year for the hatching, rearing and fattening of chickens, one at Whitby, Ont., one at Bondville, Que., and one at Truro, Nova Scotia. The chickens raised at these stations were marketed in Great Britain. Artificial incubation and brooding was employed in hatching and rearing the chickens. This method has many advantages over the natural method of producing chickens, and if we are to become a large exporting country we cannot by the natural method rear the large number of chickens we will require.

At Bondville, Que., we found that the farmers were breeding from too many hens. It is a kind of summer resort. They consequently want about fifty or sixty laying hens in the summer, and make the mistake, as I regret to say is common in other parts of Canada, or taking their eggs for hatching from all these hens instead of selecting ten or twelve of their best females and rearing their chicks from them.

To make the most money out of poultry three conditions are necessary. First, the farmer should keep a breed of fowls the young cockerels from which will mature rapidly, and can be placed on the market in a plump, attractive condition; second, the pullets must be good winter layers; third, until artificial hatching is more generally introduced early sitting hens must be available. The breeds of fowls that will satisfy all these conditions are White Wyandottes, Buff Orpingtons, and Barred Plymouth Rocks. These are the most profitable chickens for the farmer to keep.

Granted that we have a suitable variety of poultry, the most important question to consider is how to secure early-laying pullets, for an egg this month is worth half a dozen in May. We must practice selection in our layers. At this show you will notice in dairy cattle how much more importance is placed on the butter fat production of the individual cow rather than on the estimated standing of the whole breed. The same will apply to poultry. In each breed of chickens there are recognized strains that lay better than the average, and individuals that excel all others. Hence by selecting the best winter layers of any breed and breeding from them, the winter-laying trait can be established.

How, then, can these breeders be selected ? Simply by banding the legs of the ten or twelve earliest laying pullets and breeding all your chicks from them in the

spring. A better way, however, is to breed from these early laying pullets the second spring. The first year they are forced for a large production of winter eggs, but the second winter are held back from laying till their eggs are required for hatching in the spring. In this way fertile eggs are secured that have far stronger germs than those eggs that are laid in the spring by females that have been heavy winter egg producers.

Winter laying also depends on the house and the feeding of the layers. The main requirements of the poultry house are : No lice, an abundance of light in the daytime, and a warm roosting-place at night. The light can be secured by lining the inside of the house with building paper and whitewashing it, and the warmth at night by providing a curtain of burlap or bags to let down in front of the roost. To keep away the lice the chickens should be well dusted with insect powder, and the roosts coal oiled.

During the winter months the majority of layers are not given sufficient animal food, and also not sufficient fat material. The egg is composed of 10 per cent. lime or shell, 60 per cent. albumen or the white of the egg, and 30 per cent. yolk. The albumen of the egg is the same albumen or muscle food as we find in meats. Hence this albumen can be most readily and cheaply obtained from raw cut bones, scraps from the butcher, beef heads, livers, etc. The scraps can be fed either raw or boiled, if cooked, the water in which they are boiled should be mixed with meal. The yolk is pure fat, coloring matter and water. The fact can be obtained most satisfactorily from oats and corn. At the Bondville station we had pullets penned up in crates laying on a mixture of equal parts of ground oats, ground corn and low grade flour, mixed with water and one-fifth weight of cut up raw mangles. The weight of the mixed with water and one-fifth weight of cut up raw mangels. The weight of the mangels was one-fifth the weight of the meal. The pullets had no exercise, securing in addition to this mash only grit and shell material, and yet laid at a time of the year when eggs were worth 40 to 50 cents a dozen in Montreal.

How can we feed to secure the best results ? In the morning a small handful of barley, buckwheat or wheat scattered in litter. In the middle of the day a light, warm mash of equal parts of ground corn, ground oats and fine middlings, mixed with skimmilk or water and cut roots. If table scraps can be added to the mash so much the better. At night allow each chicken a large handful of whole oats or whole corn scattered around. The fowls should have waste meat of some kind every day, or if this cannot be obtained from the butcher, one pound of dried blood should be added to every sixteen pounds of meal in the mash. Fresh water, grit and shell material should always be on hand. In fattening chickens it is known that it costs from three to four cents more a pound gain in live weight to fatten chickens in December than in October under the same conditions as are found in the ordinary poultry house for these two months. Hence we see the need of warmth-giving food in the winter. Hens to lay eggs require food that first will supply their bodily needs, and then leave a sufficient quantity of nutriment to be available for eggs.

Fattening chickens is the most important branch of the poultry business. No matter how well bred a chicken is he will not bring a good price on the market unless well fatted and properly dressed. The farmer should never sell a lean chicken. In fact, the time is not far distant when buyers will not take a lean chicken. Fattening is certainly the farmer's business. It is an easy matter to fatten two hundred chickens. Mr. McArthur of Kenmore sells chickens on the Montreal market. Last year he received instructions from our Department and fatted chickens himself. This year he has a large demand for such chickens, but he prefers the farmers to fatten the birds, dress them and sell to him. He lends crates to farmers and in this way can handle a large number. I understand Messrs. Dundas and Flavelle of Lindsay do the same sort of business.

With ordinary farmers' chickens the cramming machine is not required. At the Smithville station 131 chickens gained two pounds nine ounces each in four weeks feeding, and these were not fed by machine. The chicks in one crate more than doubled their weight during the fattening period, weighing 39 pounds when going into

the crates and seventy-eight and three-quarter pounds after fattening—a gain of three pounds five ounces on each bird.

But every farmer should use fattening crates. It costs one to two cents less per pound gain to feed a chicken in a crate than in a small ground pen, and about four cents less than to feed then at liberty, so that the crate will soon repay for its cost. The mash used can be pure ground oats (the coarse hulls removed) and sour skimmilk. Another good mash is the Bondville mash—equal parts ground oats, ground corn and low grade flour. When placed in the fattening crates the chickens are fed sparingly the first week, and after that all they will eat. The mash is fed three times a day the first week, and twice a day the second, third and fourth weeks. The chickens receive grit in their troughs twice a week, and water twice a day in warm weather and once a day in cold. The mash and the water are both given warm in cold weather. No whole grain is allowed the chickens.

At the Bondville station 204 chickens in the first week in crates made a gain of 120 1-2 pounds, the second week 84 1-2 pounds, the third week 66 pounds, and the fourth week 222 pounds gain. The large gain in the fourth week was due to the cramming machine. These chickens were in very good condition when placed in the crates. When a chicken has stored up so much ripe flesh nature begins to think it has enough for any emergency, and the chicken will judge so, too, for he loses his appetite or goes off his feed, as it is called. With lean farmers' chickens this does not happen till the chickens have been three or four weeks in the crates, but with chickens heavily fed before going into the crates the time is shortened. The cramming machine is then a profitable method of feeding. A chicken should be in the crates at least three weeks in order to soften his muscles and improve the quality of his flesh and skin.

When the fattening process is complete the chickens are starved for thirty-six hours. They are then killed by dislocating the neck. Care is taken in killing to pull the head of the chicken about an inch and a half away from the neck. This mode of killing allows the blood of the chicken to drain into the neck, and is preferable to other methods of killing. If an incision is made in a fowl it will not keep nearly so long as if sent to market intact. A bled fowl eats dry and is not one-quarter so juicy or of as good flavor generally as one that has not been bled.

As soon as the birds are plucked they are placed in the shaping board with a brick on each. This gives them a compact, plump appearance, which adds greatly to their value. They are plucked dry as soon after killing as possible, and are left in the shaping board about six hours. This time is necessary to shape them, but they must not be packed for shipment until they have been dead at least twenty-four hours. The shipping cases are lined with parchment paper and hold twelve chickens each.

Q.: What is the size of the brooder ?

A.: It is 6 feet long and about 3 feet wide. Full details as to its construction are given in a bulletin the Department is now issuing. A copy of this bulletin will be sent to anyone who applies. The export poultry business is developing in precisely the same manner as did the cheese and bacon trades. The price of poultry in this country will be governed by the British market price, just as is the price of cheese and bacon, and in a very few years you will find that our Canadian chickens are as favorably known and received on the leading English markets as is our cheese and bacon to-day.

The Department has just sent over to England sixteen cases of chickens from Bondville, Que., which sold for 14 cents a pound there. Private individuals will receive the same prices in Great Britain as the Government receives for poultry of equal merit.

The Department of Agriculture, Ottawa, publishes all information that is obtained from the experimental chicken stations.

Q.: What was the cost of transportation and getting the poultry to the English market ?

In the lot shipped from Bondville, consisting of 192 birds, the cost was as follows:

Shipping to Montreal, including boxing..	$7.87
Ocean freight..	7.21
Commission..	7.03

Q.: How much did the lot cost to place on the market ?

A.: Of this lot of chickens a number of the best cockerels were sold before they were fatted, to the farmers. The amount of their sales was not credited to the lot, but the fattening crates were filled with younger chicks, so the figures are not fair and do not show the actual returns of the lot.

The cost of producing these chickens, including the purchase of eggs, coal oil and carrying the chickens to the fattening period, was $45.15. The cost of fattening was $25.98. This, including the transportation charges, makes a grand total of $98.24. The birds sold in Liverpool for $140.80. Ten birds that were left over were sold for $4.00, so that the net profit over cost of production and marketing was $51.56.

Q.: Were the birds placed in cold storage ?

A.: They were shipped by express to Montreal and placed on board a cold storage steamer.

The gain in weight and cost of feed from birth to the fattening age of chickens at Bondville, Que. :

Period.	Number chicks.	Live weight.	Meal.	Milk.	Blood meal.	Millet seed.	Cost f r week.	Av. cost per lb.
Weeks.		lbs.	lbs.	lbs.	lbs.	lbs.	$ c.	cents.
At birth.	183	15						
1st	177	19	6	9	0¾	1	36	9.
2nd		33	18	29	3	5	51	3.7
3rd		59	34	50	5		65	2.5
4th	175	81	51	60	7		92	4.2
5th		116	80	90	5		1 26	3.6
6th		161	120	135	6		1 85	4.1
7th	173	216	158	208	10		2 55	4.6
8th		278	159	198			2 20	3 5
9th		348	152	190			2 11	3.
10th		415	169	211			2 33	3.4
11th	167	486	187	235			2 59	3 6
12th		552	202	253			2 79	4.2
13th		625	229	278			3 15	4.3
14th		699	215	268			2 98	4.
15th		774	234	292			3 24	4.3
16th		848	241	301			3 34	4 5

Average weight of all the chickens when 16 weeks old, 5 lbs. 1 oz. Average cost of feed for each pound gain in weight, 3.9 cents.

A number of the best cockerels were sold to the farmers and the fattening crates were filled with some chickens only 12 weeks old.

Fattening the Chickens.

Period.	Number chicks.	Live weight.	Gain in weight.	Meal.	Milk.
Weeks.		lbs.	lbs.	lbs.	lbs.
Com	204	806			
1st		926½	120½	350	437
2nd		1,011	84½	401	502
3rd		1,077	66	409	511
4th		1,299	222	713	891

Average gain in weight per chicken, 2 lbs. 7 oz. Cost of feed per pound of gain, 5.2 cents. The cramming machine was used the fourth week.

A lot of pure bred and grade Barred Plymouth Rock chickens were fatted at the Smithville, Ont., Station. These chickens were in a healthy but lean condition when placed in

the fattening crates, and were fed out of a trough throughout the fattening period. The cramming machine was not used :

Period.	Number chicks.	Live weight.	Gain in weight.	Meal.	Milk.
Weeks.		lbs.	lbs.	lbs.	lbs.
Com	131	491½	.....	.....	.....
1st	.....	654	162¼	252	438½
2nd	.....	677⅝	23⅝	227	435¼
3rd	.....	756¾	79¼	286	464
4th	.....	827	70¼	286	534

Average gain in weight per chicken, 2 lbs. 9 oz. Cost of feed per pound of gain, 4.6 cents.

Hon. Sydney Fisher : In these experimental shipments the express charges in Canada are altogether too much. The ocean freight is a comparatively small item. When the business is established these express charges will no doubt be replaced by freight charges, but at the present time we have only small shipments, and the only thing we can do is to send by express.

Superintendent Gilbert, Poultry Department, Dominion Experimental Farm : The two main obects for which the hen is kept should be to supply the winter market with eggs and the summer market with chickens. Eggs sold in Montreal a week ago at sixty cents per dozen. To make a success of the business you must first secure the proper breeds, and then treat your chickens properly from the time they are hatched until they are finished. You cannot get large chickens from miserable scrub stock. The two breeds best suited to your requirements are the Rocks and the Wyandottes. What are their particular merits ? They are both winter layers and rapid flesh producers.

In producing eggs for the high-priced winter markets the farmer should utilize as much of the waste of the farm as possible. In the spring time the farmer finds himself in this position : He has to face a declining market for his eggs. Then is his opportunity to convert the eggs into chickens. There are two ways of doing this, either with hens or by artificial incubation. Incubators are now so easy to work, so certain in their results, and so cheap that they are within the reach of every farmer. I do not advise the farmer to keep more hens than he can attend to without encroaching upon the other departments of the farm. The moment he does this he becomes a specialist and requires special facilities and apparatus. What the farmer wants is to have a great many chickens as early as possible. The difficulty in employing hens is that if they lay all winter they will be late sitters and will raise only a few chicks. This is where the advantage of artificial incubation comes in.

Having got your chickens you must attend to them, particularly during the first five weeks of their existence. If a chicken is allowed to become stunted during that period it never gets over the neglect. If they are hatched by the hen we take the mother hen and the brood and put them on the grass in slatted coops, because if the hen is allowed to run about she will take the flesh off the chickens as fast as we can put it on. We have found the most economical and certain way of putting the chickens on their legs is by giving them first of all bread crumbs, after leaving them alone for 36 hours after hatching. Follow with bread soaked in sour milk and squeezed dry. After the first five weeks you must feed them on chop, and the most convenient form of food you can get. Into this the waste of the farm should largely enter. At the age of three months they should be ready to sell. You can either sell them to the local market or to some of the large export concerns.

I do not think it will pay the farmer as a general rule to rear chickens for fattening. I believe he should rear the chickens and sell them to the large purchasing companies. I think these will be two distinct branches of the business, and I think the farmer should confine himself to the first.

In addition to the Rocks and the Wyandottes, I want to mention a new breed that is coming to the front. It is called the Buff Orpington. I have here a specimen pullet. It is light in flesh and light in the leg, and will I believe come to the front for all purposes.

I strongly advocate the use of pure bred stock as it is much more profitable. A crammer is not necessary for fattening pure bred chickens, provided they are treated well from the time of birth.

Now, as to the profits of the business: I have here a letter from a farmer in Franklin, Quebec, in which he states that he has made over $2 a piece from 80 hens. As to his method of feeding, he writes me that in the morning he feeds a mash consisting of turnips and cut clover hay all steamed, to which he adds corn meal. At noon he feeds roots, mangels particularly, and in the afternoon a ration of grain.

Another case is that of Alex. A. Fraser of Sandringham. He began with scrubs and sold them for five cents per pound in Montreal. The next year he bought a registered Plymouth Rock cockerel, and sold the fifty or sixty chickens produced from this bird and the ordinary barnyard hens to the same party for 8 1-2 cents. Next year he got an entirely pure bred flock and sold his birds for 9 1-2 cents, and to a customer in Ottawa he sold some for 10 cents. It costs no more to fatten a pure bred than a scrub, if as much, while the former sell for nearly double the price.

You have heard a good deal about the fertile egg. It is easier to get a fertile egg than it is to get a strong germ, which is necessary in order to produce a strong chicken. Sixty per cent. of the fertile eggs in the early spring die during the hatching stage. This is due to the hens having been long in confinement during the winter and fed on stimulating foods. Hens should be allowed a runway in the winter, so as to give them exercise and plenty of fresh air. This is necessary in order to produce a vigorous germ in the egg.

Mr. B. Silverwood, of the Dundas-Flavelle Company, Lindsay: I can corroborate what Mr. Gilbert has said from the experience of our company. Two years ago Mr. James Watson of Sonya began raising good chickens. This year he sold to our company 69 chickens at $1.12 a pair. The birds were fattened in ordinary coops, being fed on ground barley mixed with milk—just the ordinary products of the farm. They weighed from 7 to 10 pounds, cost 5c per pound for production and sold for 7c per pound.

Q.: Is it correct that the Canadian market requires small turkeys while the English market requires large birds?

Mr. Silverwood: That is correct. For the local trade a small bird is most suitable. For the English trade what is required is young Tom birds weighing from twelve to twenty pounds. We give half a cent premium for Toms weighing over twelve pounds. For the local trade we prefer light hens.

Superintendent Graham, Poultry Department, Ontario Agricultural College, Guelph: I wish to emphasize what has been said about the importance of having pure bred stock. Here is a specimen of a scrub chicken (lecturer produced bird not much larger than a partridge) which we fed in the ordinary crate and from the crammer for 10 weeks, and it gained half a pound.

Q.: How often did you feed it?

A.: Three times a day to commence with, and then with the cramming machine twice a day.

Q.: Was he healthy?

A.: He was a strong, vigorous bird or he would not have stood the crammer for three weeks.

Q.: Could you have found a worse specimen?

A.: Yes, I could.

Q.: Is he fully developed now?

A.: Well, he ought to be. (Laughter.)

Q.: Was it raised by a farmer?

A.: Yes, near Guelph. (Laughter.)

Hon. Mr. Dryden : Can you find that man ? Because, if so, I would undertake to make him a present of a Plymouth Rock cockerel.

Q.: How did it manage to reach even that size ?

A.: Even a bantam will reach a certain size, but you cannot get it beyond that. It is just the same in this case. This chicken got as far as its scrub nature would permit, and there it stopped because there is no frame to build on. I introduced this specimen to emphasize the importance of having well bred stock. The man who produced this bird will do better next year. He took a pure bred Rock cockerel home with him, which will ensure his getting some good chickens next season.

I wish to refer to our experiments in controlling the color of the meat by feeding. The old country buyer will pay a premium of a cent or more per pound for a white-fleshed bird. The best markets in this country also show a marked preference for such birds. It is quite possible to make the color of the flesh white or yellow by feeding. The Dorking is the only bird the color of the flesh of which I have been unable to influence. It is naturally a white-meated bird, and I have been unable to get that bird a yellow color.

The results of my experiments show that skim milk, buckwheat and ground oats give a light cream colored flesh. Corn meal and turnips gives a yellow color to the flesh. If you want white meat do not give your birds much corn. I am inclined to believe that turnips and cotton seed meal are also inclined to produce yellow flesh. I think a yellow bird can be made good color in three weeks time by judicious feeding. We have never failed to get them white in that time. The only occasions on which I have failed to do so were when the chickens came in fairly fleshy and were put on the cramming machine for 10 days. You will improve their color, but you cannot get them very white under such circumstances.

Q.: How did you feed the turnips ?

A.: They were cooked. They will eat more cooked turnips than they will raw ones. In our experiments roots have proved of no advantage whatever in fattening chickens.

Mr. Hare : We fed nine lots last year, using mangels and water instead of skim milk. We found it prevented the overheating of the blood and feather picking, but the quality of the flesh was not as good as grain-fed birds. If you cannot get skim milk, use roots to cool the blood, but they are of no use for fattening.

Superintendent Graham : I may say that the only time I had any trouble with feather pulling was when the birds were fed largely on corn. This is a heat-producing food.

This subject was dealt with more fully by Mr. Graham at the meeting of the Eastern Ontario Poultry Association. See page 46.

Q.: What would you use in place of oat dust if that is not obtainable ?

A.: Use ground oats with the hulls sifted out.

Mr. Hare : I think Mr. Graham had better call it oatmeal siftings instead of "oat dust." You must not use the dust from the hulling or it will interfere with the digestion. I think there is liable to be some confusion here.

Superintendent Graham : The reason I call it "Pearl Oat Dust" is because they give it that name at the mill.

Q.: Could you use peas and barley ?

A.: Peas are all right at this season, but not earlier.

Mr. Silverwood : We fed about 4,000 birds last fall, and if we allowed the hull of the oats to get into the feed we always had trouble.

Superintendent Graham : In our feeding experiments we divided our birds into three lots. One lot was placed in a loose pen, another lot in a crate, and the third lot was fed in the crate until the last ten days, when the birds were fed with the cramming machine. Lot 1 consisted of birds weighing from 2 1-2 to 3 pounds, lot 2 of birds weighing from 3 to 4 pounds, and lot 3 of birds of 4 pounds and upwards.

We found that the larger chickens cost far more to produce a pound of gain than the smaller ones, which proves that the cheapest gain is made early in life.

We got 11 cents for the crammed chickens, 10 cents for the crate-fed chickens and nine cents for the birds that were fed loose. The crammed chickens gained 2 pounds each in 3 weeks, the crate-fed birds gained 1 1-4 pounds, and the loose fed gained 3-4 of a pound each. The crammed chickens cost 4 3-4 cents, the crate-fed birds 6 cents and the loose fed 7 1-2 cents. One peculiar thing we noticed was that the chickens that ran loose would not eat as much as those in the crates.

Now, as to the ideal type for feeding. The right type of bird should have a great development of breast. It should be wide in front and moderately deep. You should have a nice bright eye, and a short stout beak to indicate constitution. Birds must have constitution to stand forcing in the crate. The bird should be wide between the legs, so that he will fill out and present a nice appearance when dressed. The legs should be straight and not too long. Do not get a knock-kneed bird, as if they are knock-kneed or have twisted legs, they will get so that they cannot stand up after they have been in the crates for some time. In the back the width should be carried well to the rear.

Q.: Is a light colored leg an indication of light colored flesh ?

A.: It is. The greatest fault with the Rocks is that they are flat in front of the breast. This is a point where the breed might be improved.

Q.: What is the net profit in handling a lot of birds where you are buying feed ?

A.: I consider about fifteen cents on an average. A chicken costs 25 cents and sells for 50; feeding costs eleven cents and we then have fourteen cents profit.

Q.: Was not the cost of production cheaper last year than this ?

A.: Yes; last year we did not handle so many birds, the birds were of a better type, and we got our grain cheaper.

Q.: What is the cost of fattening 1,000 birds by the cramming process ?

A.: About 12 cents each.

Q.: You estimate that the profit is 14 cents, not including labor ?

A.: Yes, but I have not been able to figure on the cost of the labor with any exactness. We feed 150 birds per hour with our cramming machine, with a boy and a man. They can be fed much quicker in crates, however.

NOTES ON THE USE OF INCUBATORS.

By L. H. Baldwin, Toronto.

It is just as necessary for the poultry farmer to use incubators as it is for the grain farmer to use modern machinery. If you want to raise chickens in any number, anything over 100, for instance, it is absolutely necessary. Another reason is in order to get early-hatched pullets, which make the best winter layers. The natural season for hatching is in the spring—May and June, preferably, but it is difficult to get hens to sit in March, which is the month in which you should hatch your winter layers. Hence the advantage of the incubator. As to the use of the incubator, you should read the manufacturer's directions over and over again, and follow them exactly.

The greatest difficulty I find is to know what amount of ventilation to give the eggs. Too much ventilation causes them to dry up too much, and you have weak chicks. If you do not ventilate enough, too much moisture will generate in the egg and the chicken will drown. In this you must be guided by the chart supplied by the manufacturer. As this matter of ventilation is the secret of success, I have kept records or charts of my operations from year to year. I have marked in red ink each day on which it was necessary that something should be done. For instance, the 4th day is marked in red; this indicates that I begin on that day to take the eggs out to cool. On the 9th day I know it is time to test the eggs, as all dead germs must be out of the incubator before the tenth day, as on that day the germ increases in activity and the presence of dead germs interferes with the temperature.

I test again on the 14th day for the purpose of extracting dead germs. On the 17th day I give the eggs an extra cooling. This is the last day on which I cool the eggs. On the evening of the 18th day I close the machine, and it remains closed till the hatching is finished. Do not open it to help weakly chicks out of the shell, as it will do injury to others. Keep the machine shut. That is the time when the eggs want moisture. If you open the incubator, away goes your moist air and the cold air goes in.

I keep a hydgrometer in my incubator room to indicate the relative humidity or the amount of moisture in the air. It is moister in summer than in winter, when there is artificial heat in the house. I keep a record of this right through the hatching, taking it morning and night, and also a record of the amount of ventilation I give. I prefer two thermometers, one lying on the eggs and the other suspended in the incubator. I can tell from experience by the amount of variation between the two thermometers whether the hatch is likely to be a good one or not. During the first ten days is the most important time to run the machine evenly.

Contrary to what many people suppose, an incubator really wants very little attention. It takes about five minutes in the morning and fifteen minutes at night, when the eggs have to be cooled and the lamp trimmed. You will spend a good deal more time than that on a dozen hens, which number it will take to hatch as many eggs as a small incubator will hold.

For practical purposes, I do not think it is wise to get a machine that will hold less than 220 eggs, but it should not be larger; it is better to have two machines of 220 eggs each.

After the birds are hatched out they are placed in the brooder, where they are left for 24 hours without being fed.

Question : Many farmers in our section purchased incubators, but failed to make them a success. Either they did not understand the incubator or did not use proper conditions. Sometimes they have the incubator placed beside the kitchen stove. Where should they be placed ?

Answer : I would as soon have them in the kitchen as anywhere if you know the relative humidity. I use my cellar. I have a room next to the furnace, with a temperature of 55 degrees to 65 degrees. The great thing is to avoid sudden changes. If you have a temperature of 65 degrees or 70 degrees in the day and below zero at night, it is too much to expect the incubator to equalize it, although they will do a great deal in this respect.

BREEDING AND FEEDING OF TURKEYS.

Exhibitors of turkeys at the Winter Fair at Guelph were required to write an essay, giving particulars as to how their exhibits were fed and cared for. Three prizes were offered for the best essays, and were awarded as follows: First, W. J. Bell, Angus; second, P. Scaulon, Ennotville; third, A. McDougall, Milton.

By W. J. Bell, Angus.

I keep only the bronze variety. They are given free range at all times, except the old hen while brooding her young. During spring, summer and fall they roost on fences near out-buildings, and during the winter partly in an open shed facing east, and partly in an old log barn, single boarded on west, north and east. About December 1st I have them pretty well "sized up," and know the ones I will retain for breeding purposes the next season. I select the best shaped, heaviest boned and finest marked ones in the flock. In the male bird I have, with three exceptions, used one that has had 3-4 of the original blood with which I started fifteen years ago. My plan of introducing fresh blood is by means of a female, and this hen's female offspring is bred back to her sire. I then select males from this mating to head pens. I could never notice any difference in the flock from using young, yearling or two year old Toms, but have had best results from young hens. Large young pullets usually develop into heavy hens that lay soft-shelled eggs, and also break their eggs while hatching.

One male to six females is about the average of my pens. I try to feed the male pretty well during the winter, but hens only lightly, as they are liable to get very fat coming on spring, and eggs would then be infertile in many cases. They can find about enough on range to do them. It is necessary in some cases to pare the spur and nails of male to prevent him tearing the hens.

About the first of April I place boxes and barrels where I want the hens to lay and sit, and by watching them until they lay two or three eggs, I can generally get them to sit in a good place near the buildings, sometimes in the buildings, and, further, I know where each hen lays. Some turkey hens will be looking for a nest two weeks before she commences to lay. I take the eggs as laid, mark and put in bran in a cool place, not forgetting to turn occasionally. I also place a Leghorn hen-egg in nest in place of the turkey egg I take away, to entice the turkey back to the same nest. When hen wants to sit I see that nest is fixed so that young poults on hatching cannot escape. Place fine straw or hay in bottom, which is left rather flat in order to prevent the eggs pressing together in the centre. It is then dusted thoroughly with Persian insect powder, the eggs the hen laid, about seventeen on an average, placed in same and left. If the nest is down near the ground I close up the hen at night to prevent dogs or other animals chasing her off, but if up from the ground a distance, I leave the hen entirely to herself and let her hunt her own food and water. Every time I notice her off the nest during incubation I go and look if any eggs are broken; if so the balance are washed off clean in luke-warm water and fresh material put in nest. About the 26th day the hen is sitting I go quietly to the nest and dust insect powder over the hen's back and also around her. I think it wise to not spare the powder at this time as the poults getting a start free from lice is one of the important points. However, I do not like to disturb the hen much in doing so. The 29th day I do not hesitate to gently run my hand under the turkey and quickly lift her off the nest. I do this to ascertain how they are hatching, and sometimes it will save a poult's life by removing a hatched shell from over an unhatched one.

In case all are hatched, I mark each one, either by punching a hole in web of foot or cutting off a toenail. If marked the first 24 hours after hatching they seldom bleed, and the mark shows better than if left till they become older. I let the hen go on again, and next day—if it is in May—I take her and clutch to a large dry goods box on the south side of the house, put them all in and place boards loosely over the top. In putting them in the box I pick the small scale off the point of the bill. In the box I placed a saucer with some bread crumbs mixed damp with milk, stick some around the sides of the box, and also keep working some on my hand in among them. They do not learn to eat very quickly, but by going to the box five or six times this day I have them pretty well started by night. I feed once or twice in box the next morning, but if weather is warm about noon I change hen to an "A" shaped coop, with lath front, and give the poults their freedom around coop. If weather is not warm I leave in box an extra day, but never longer, and if hatch comes off in June I take direct to the coop excepting an unusually cold time. I keep this coop away from where the chickens (Leghorns) are, and have a dry place for the poults to dust, and also some fine gravel to pick over.

It is important that they get the latter as soon as placed in coop. Sometimes a cold spell will come on, and I put chaff under the coop and throw a blanket over same until weather moderates. When two days from nest I gradually change food from bread to shorts, mixed with skim milk, and give both milk and water to drink, sometimes in separate utensils at the same time and again alternately. It is necessary to give fresh drink in clean vessels at different times during the day. In mixing the shorts I sometimes get a grade that will not mix properly; I then add a very small quantity of brain or oatmeal to prevent this. Generally it is not needed if careful in not putting in too much milk. By watching the poults I can ascertain how they like it. Twice a day I cut up fine, with a pair of old scissors, a quantity of dandelions and onion tops with the shorts. They are very fond of this green food, and I think they are beneficial in keeping up appetite and helping to keep bowels in order. I feed them this way four times a day—always off my hands—for about five weeks, taking care to

let nothing prevent me from moving every day the coop in which the old hen is confined. I have a scare-crow near the coops to keep hawks and crows away, but it does not keep all away.

I mix up fresh food at every meal, and give what the turkeys leave to my Leghorns. A great many raise young turkeys successfully by giving both hen and young their liberty from the start, and feeding little or nothing, but I have fields of grain running up to the yards, and am terribly bothered with hawks and crows, so that I am compelled to keep them near the house until five weeks old, when I give the hen her liberty and only feed twice per day, shorts in the morning and wheat at night. I give them all the skim milk and buttermilk they will take. Sometimes they get so much on range they will refuse the wheat, but they like the shorts in the morning. I have reasons, satisfactory at least to myself, for feeding shorts. It is well known that young turkeys have a tendency to looseness of the bowels, and I think this is equally well known that this is caused by indigestion in some form. Shorts are easily and quickly digested, therefore, I claim, helping to prevent this diarrhoea, but as they digest quickly, it is important that they be fed often. If I were using ground grain instead of shorts I would not feed so often. However, above all, I would advise breeders to be very careful in making sudden changes from one kind of food to another. From the time the hen is given her liberty until about October 1st very little attention is given except to see that all are up at night, and if they have full crops. They roost on fences near the house.

From the beginning of October, I try to get them to eat large quantities of different grains—oats, peas, barley or wheat. They are fond of the latter, and it makes a satisfactory food—price and results considered. An occasional feed of small apples after snow comes on is very much relished and good for their health. I have always sold all I raised for breeding purposes, therefore cannot give my mode of dressing for market. I would never close up in a building to fatten, as they pine for freedom and fail to put on flesh. I have known breeders to advise to put salt in the food of the young birds, but I have known cases where it was death to a whole flock. Sulphur, I consider equally injurious. In preparing my turkeys for exhibition I look carefully over for good points—the standard of perfection being the guide, wash off their legs and feet and take as carefully as possible to the show. This is about all that can be done for turkeys in the way of preparing for exhibition.

By J. Scanlon, Ennotville.

We keep about four young hens and one Tom for breeding purposes. By feeding liberally the young hens will lay earlier and usually more than old ones; by leaving barrels and boxes in corners or out-of-the-way places, they will lay in them and are not so apt to steal away to lay as old hens are. When a turkey hen wants to set, get a shallow box, put some fresh earth in the bottom, then some chaff on the top, shape it like a nest, put it in some quiet place and move the turkey to it at night. If there are more eggs than she can cover put the balance with a chicken hen, when the young turkeys hatch give them all to the turkey hen. When she wants to leave the nest get a box, take the bottom and one end off, nail lath on the end, leaving space for the young turkeys to go in and out, give the hen a good dusting with insect powder before putting her in the box. For the young ones get white precipitate one part, lard ten parts, make an ointment of it and apply it sparingly to the outside of the wings, at the base of the quills (a favorite resort for vermin); also use a little around the necks. We find this a very effective remedy. Move the box to a fresh place every morning.

For the first week we feed the young turkeys eggs and milk, with a pinch of salt added, boiled together until firm, then add bread crumbs made from low-grade flour and bran. Do not wet it; the egg and milk will make it moist enough. We frequently mix in some finely-chopped onion tops or similar green food, and over all dust a little black pepper. It acts as a tonic. This, with an occasional feed of finely-chopped meat, constitutes their diet. Feed every two hours the first week. As soon

as they get strong enough, let them out to roam about the fields, and feed once a day, and that in the evening, a little of the coarse bread, until they get big enough to eat.

As soon as they will eat wheat we give them nothing else, and that only to coax them home. We find that by giving them their liberty they roam about the fields, picking up grubs and insects and grow bigger and stronger than if confined. They are very little bother from now until fall, when the fields are bare and the natural food is scarce.

In order to fatten them for market they need extra food. We do not believe in shutting turkeys up to fatten; give plenty of feed, and feed regular, and they will be on hand at the right time. The fattest and best turkeys we ever had were fed on turnips, boiled, and chopped barley mixed in when the turnips were boiling. They got all they could eat three times a day, and were given milk to drink. This gives the flesh a nice white color. A little Pratt's food in the mash once a day keeps the birds in good health. If any should get cholera give them a strong solution of hyposulphate of soda, a teaspoonful of soda to a quart of drinking water, and feed very little for a day or two. For blackhead give five or six drops of castor oil, and two or three whole black peppers to each bird, a little cayenne pepper in the soft food is a preventive of this disease. Turkeys should be fed heavily for a short time, then dressed and sent to market.

In conclusion I would say, get your turkeys to lay at home, and save trouble looking for nests. Feed damp not sloppy feed to the little ones. Let the old hen have liberty to roam, she knows best what is wanted. Keep them away from other poultry as much as possible. As soon as they start to loaf around the building look out for trouble.

By A. McDougall, Milton.

My experience in raising turkeys has been a very successful one, extending over quite a number of years. I breed from only fine healthy stock, saving my best for that purpose, and do not breed from the same stock long. Turkeys differ from other classes of poultry in many ways. The domestic turkey is but few removes from its wild ancestors, and much of that wildness still remains. They cannot be confined profitably, and the larger the flock the greater the disposition to roam. I change my gobbler every year, or sometimes keep him a second year if the offspring are healthy and good, and select hens from my own stock, as they are less inclined to wander away than strangers.

New blood I consider a great point which the average farmer neglects, getting birds too near at home, which are often inbred, and that is the cause of a great many deformities. I usually import a gobbler, and in doing so aim to choose one that is robust, a vigorous grower and of strong constitution. If more care were used in the matter of selection it would be a small job to overcome the worst diseases. Roup, cholera and other diseases are much more easily prevented by proper selection of breeders than by any other means, and I know that if one can get breeding stock that has been free from them for a few generations it is an easy matter to raise turkeys.

As soon as I notice my turkey hens manifesting intentions of beginning to lay, I prepare nests for them in out-of-the-way places about the premises. Placing the nesting material in an old barrel and piling heaps of brush fodder or other litter around and upon it, and usually the hen is obliging enough to lay in it. If several of the hens begin to lay at the same time, I set the first one that becomes broody, and at the same time set two chicken hens on turkey eggs, giving all the poults when hatched to the natural mother, as she alone understands their needs and can care for and protect them properly.

When the poults are 24 hours old, I thoroughly dust them and their mother with a good lice-killer, and take them to the most solitary places about the orchard, where I have a pen built of twelve-inch wide boards, and that is their home till they can fly over the twelve-inch boards, when they are given their liberty.

While they are penned I feed them custard (made of sweet milk and eggs alone) three times a day, giving the mother a handful of grain. This custard is both food and

drink for the young poults, and I have never known one so fed to be sick at all. Lice must be watched for, of course, and the dusting repeated every week or so, even after they are half grown.

After they are three months old they may be given cracked wheat, corn, and such like, but no whole grain until they are five or six weeks old. and then to finish them up for market, I feed pea, corn and barley meal, scald and feed all they will eat while it is warm. Do not leave anything before them for any length of time, as it becomes foul and unfit for use in a short time.

Feed three times a day; the mash morning and noon, and corn at night. This diet will, in a few weeks, put turkeys in a grand condition for market.

By W. R. Knight, Bowmanville.

My method of raising bronze turkeys is to let the hen lay and set on her own eggs, and raise her own brood. The first few days I feed bread crumbs and give them milk to drink. After the first week I feed coarse shorts, cut onion tops and powdered charcoal, morning and night, and give them their liberty through the day. I also give a little wheat, and in this way have had the very best results.

By Cullis & Lean, Powell's Corners.

We prefer old hens to pullets for breeders, as the young poults from these are usually larger and stronger. The turkeys are wintered in an empty barn, and as a general thing little trouble is experienced in getting them to lay there. As soon as a sufficient number of eggs are laid, they are set under hens, two being set at the same time. The turkey hens are allowed to hatch the second laying themselves. The nest and hens are thoroughly powdered when set, and again three or four days before hatching. The chicks are left in the nest the first day, then taken out and fed on moistened (not wet) bread. They are placed in a coop, in a yard, made of boards about fourteen inches high, and as soon as they are able to jump over it they are let go. The coop must be moved into fresh grass at least every second day. When from ten days to two weeks old the food is changed to shorts or oatmeal, mixed with milk, if to be had; if not, with water, but not to be made very wet.

One of the commonest mistakes is overfeeding. As soon as they are able to range at large they are left to forage for themselves, being only fed morning and evening. We have found that confinement even in large barns means death to young turkeys. Fresh water is necessary, and should be placed in shallow vessels, so that they cannot get wet. For about three weeks before shipping we give them a morning feed of oat, pea and wheat chop, mixed with hot water and fed warm ; at night whole grain, wheat, barley or peas.

By Thos. Brown, Durham.

I hatch the eggs under turkey hens, and when the young turks are 24 hours old I start to feed them granulated oatmeal and sand for the first two weeks, then give them cracked wheat and corn until eight weeks old, when they are turned out on the grass hills to hunt for themselves till fall. These hills are partly shaded with second-growth timber and harbor lots of insects of various kinds. I feed no more until they come home about October. They roost all summer on the fence, and in trees. When they come home in the fall I feed them a mixture of chopped oats, wheat and barley, mixed with milk, until they are fit to kill. It costs about thirty cents each to raise young turkeys, and have them fit to kill about December.

By W. E. Wright, Glanworth.

When the little turkeys are first hatched out, I do not feed them until they are twenty-four hours old. The first feed that I give them is stale bread, soaked in milk

and pressed out quite dry. Care must be taken not to have the food wet or sloppy. I also give them sweet milk to drink. When they are a few days old I give them a change of diet, such as hard-boiled eggs, chopped up very fine, and mixed with bread crumbs, with a sprinkle of black pepper over the food occasionally. At other times I give them a feed of curds, made from sour milk, with tender onion tops and dandelion leaves chopped up very fine. They seem to be very fond of this, and will pick out all the green stuff before the other food. I always keep plenty of clean drinking water before them. I find it a good plan to sprinkle fine sand or grit where they are fed, as the grit sticks to the food, and helps to digest it.

When the turkeys are about two weeks old, and can take stronger food, I make them a cake, composed of bran, shorts and cornmeal, mixed with sour milk and baking soda, baked and crumbled fine. Care must be taken that no lice get on them, as I believe more turkeys die from lice than from any other cause. When they are a day old I dust the mother hen and all the little ones with insect powder. I usually take all the little ones and put them in a large basket and dust them one by one so that none are missed, and I keep dusting them every few days until they are three weeks old. I always put the coop in a sunny place, and place near the coop a large shallow box, filled with road dust, for the little ones to dust in. I have the coops made without bottoms, and by moving the coops on fresh ground every day they always have a clean place when under the hen. When they are twenty-one days old, if the weather is fine and dry, I give them their freedom.

I drive the mother hens with their litttle ones to the woods, a beech grove about 70 rods from the barn. In find that they scratch in the leaves and get grubs and insects. I sprinkle fine wheat screenings under the trees, and in this way they get plenty of food and do not wander far away. I find that they do better in the woods when they are young, as the grass is much shorter there than in the fields, and they do not get wet with the dew in the mornings.

When the little turkeys are strong enough to travel well I start driving them home every night, for a few times, and by giving them feed when they get home they soon learn to come home by themselves. When the turkeys start to roam through the stubble fields, and hunt insects, and grass-hoppers they do not need any feed until fall, except a little feed and plenty of clean water to drink to entice them home. Their I find that they do very well on a mixture of corn, oats and wheat.

By Thos. McShea, Fergus.

With regard to raising and feeding turkeys, my plan is to dust the nest and hen well with insect powder a few days before the birds are expected, and when the young birds are 24 hours old dust them again, and twice a week rub the head and under the wings with lard until about six weeks old, to prevent vermin. For the first few days I feed hard-boiled egg and bread crumbs mixed, and after they become hardy I feed a mixture of two-thirds cornmeal and one-third bran, damped with water. I prefer to hatch young turkeys under the turkey hen and allow them to roam. After they are a few weeks old they seem to grow better and appear more healthy than those hatched under a hen and raised around the farm yard, and they are sure to return every evening.

HOW SOME OF THE EHIBITORS OF DRESSED POULTRY PREPARE THEIR BIRDS FOR MARKET.

By J. W. Clark, Onondaga.

In making choice of any animal for domestic purposes, an important, and in fact a necessary point is to examine the structure of the animal relative to the work which it is to perform. It would suicidal, on the part of a horse-buyer if he were simply attracted by color, for he must in the first place examine the animal to see whether it is built upon lines enabling it to perform the work he wishes it to do. The same

is equally true in the case of all animals, and this principle ought to be laid down for the guidance of all poultry-keepers.

Our first point in the choice of stock for producing table poultry is that they shall be built in such a manner, as to carry a large quantity of flesh in the right place, that it shall have good quality, be by nature a quick grower, fatten easily and is sufficiently hardy. A further most important matter in the selection of table poultry for export is as to the color of the skin and flesh, if we cater to that high-class market over the Atlantic, willing to pay fancy prices for the properly finished bird of the right class.

In selecting birds to breed from, I pick out blocky ones, good full breast and wide across the shoulder with short, light-colored legs (avoid long-legged, long necked ones)—you might as well try to feed a long-legged, raw-boned steer, and expect a fine specimen for export as to feed a long-legged cockerel with a deep sharp breast-bone and expect a fine table fowl; select birds with a small comb, also the lighter the color of the legs the better; avoid dark yellow legs if possible. A bird with short, heavy bill, wide between the eyes will generally denote strong constitution, which is essential in heavy feeding.

The heavy feathered class, such as Brahmas, Cochins and Langshans, are not as profitable to the producer for you have to grow an enormous amount of useless feathers, which takes considerable strength from the bird to produce and are much harder to pluck. They are also much coarser in flesh than most other varieties. I am a firm believer in cross breeding, rather than line breeding for table poultry; if you line breed for years your stock is apt to get less hardy. By introducing new blood you get much stronger chicks. Cross the Indian Game on the Rock or Wyandotte, or Rock and Wyandotte cross, or Indian Game on the Asiatic class, and good results will follow. The Indian Game is a light-feathered, plump-breasted, vigorous bird, with extra fine flesh.

Anyone raising any quantity of poultry cannot afford to be without an incubator. Get a good reliable machine. I mate my hens with cocks or cockerel; one to fifteen or twenty hens is plenty to get strong chicks. Give hens plenty of exercise, with grain ration and a supply of green bone and meat, which are most essential. If confined, avoid too much soft food, to insure fertile eggs. After my chicks are out I do not feed for 24 hours. Nature provides for this time. They need some grit of some kind almost the first thing, some coarse sand mixed with their food, which should be boiled eggs, chopped fine; granulated oatmeal, fed dry for the first week. Avoid too much sloppy food on the start as it is apt to cause diarrhoea, which is so common in little chicks. After a week or ten days old a little grain or millet seed may be given. Feed three or four times a day for a while, a liberal supply of green bone and meat will make them grow much faster and mature earlier. Extreme care should be taken to watch for lice, which is the greatest enemy. There is not half so much trouble if an incubator has been used.

At four or five months old I crate for fattening. Before placing in crates, I dust with sulphur and insect powder mixed, also grease legs to keep them smooth and bright. I have my crates arranged wtih a small pail of water and one of coal cinders made from soft coal, same as a railroad engine leaves. These cinders are very hard and flinty, which answers for grit, and the charcoal, which is softer, aids digestion. This is the best grit I have used as it answers a twofold purpose. I feed largely on white meal, made from rolled oats, which I get from the oatmeal mills. This I mix with buckwheat chop and skim milk, half and half, for first two weeks. Great care must be exercised in the first few feeds or you will stall your birds, as they are not used to that change of feed. Feed three times a day for two or three weeks.

The small pails are fastened on each division so that two lots of birds can use the one dish ; in this way you have water and grit before them at all times. After the second or third week I put on the crammer to finish, using white meal and skim milk with tallow added, one pound to sixty or seventy birds twice a week from ten days to two weeks. They are then ready to kill. This is done by breaking the neck near the head and plucking at once. They are then placed on a shaping board, with weights

placed on top to give them a compact appearance. They should be off feed before killing 36 hours to empty intestines. Average gain first week, one pound each; second week, one-quarter pound; last ten days on crammer one and one-quarter pounds each. Cost of feed 6c per pound.

By C. C. Heaven, Oakville.

The chickens were all hatched in Cyphers incubators, 220 egg size. The White Wyandottes were hatched May 19th, and the Rocks and Buff Wyandottes the following week. After drying off well in the incubators, I took them straight to small outdoor brooders, in which they were confined for the first day, the floor being covered with sand and a little chaff, and a very little millet seed and fine grit amongst it. The second day they were let out into a confined space about four feet square. For the first week I fed rolled oats, millet and a little stale bread crumbs, five times a day, with clean water each feed. When about ten days old they get a little cracked corn and wheat, and when a month old I feed mash once a day (in the morning) composed generally of shorts, finely ground oats and a little cornmeal. At noon a light feed of cracked corn or whole wheat is given, and at night wheat. These chickens were only in the brooder three weeks, as by that time I wanted the brooders for another lot of chicks, and I think they would have thriven better if kept there for another two weeks. They were then moved into a coop and about the middle of August put into roosting coops; from these coops they were moved into the fattening crates on November 9th. The average weight was 5 lbs. 8 oz., the Plymouth Rocks being slightly the heaviest. I had intended to feed from the trough for two and one-half weeks and by the crammer for ten days, but the crammer did not arrive in time so was only able to use it for four or five days. They have been fed from the trough twice a day with a mixture of one part corn chop, three parts oat dust and one part shorts, mixed with milk and water and fed with the crammer. They have gained an average of about ten pounds five and one-half ounces in the three weeks, and the thirty birds have eaten 215 pounds of grain.

By N. W. Switzer, Streetsville.

The birds which I exhibited were pure bred Barred Plymouth Rocks and were bred from two-year-old hens, mated with a cockerel. They were hatched in May. I set two or more hens at a time and gave the chicks to one hen when not over fifteen. I keep the hen shut in until the chickens are big enough to keep up with her; then she is allowed to run out, and in that way the chickens learn to hunt, and the hens return to their own coops at night. Even after the hens leave them the chickens go back to their own coops, until they get too big for the coop; then they have a shed with roosts, which answers a double purpose as a shelter from the sun in the daytime and a roosting place at night. They remain in this shed until the weather gets cold. This year they stayed out until the 8th of November, then they were put into fattening coops in the barn. After the chickens come out of the shells I leave them on the nests for twenty-four hours, then they are removed to the coops. During the next twenty-four hours I feed them ground grass and a little rolled oatmeal. I feed oatmeal for three or four days, then commence to feed them a mixture of ground oats, ground corn, bran and shorts, mixed with milk and baked in the form of cake. I feed this cake five times a day until they are about two months old, then feed only three times a day, and substitute whole grain at night, wheat tailings at first, then wheat and oats. I fed cake until they were about three months old, then fed the same mixture mixed with milk, without baking. About the middle of October I commenced to mix some boiled potatoes with their mash morning and noon. On the 8th of November they were put into fattening coops. The first twelve I put in weighed 96 pounds, and during the first eight days made a gain of nine pounds. During the first week in fattening coops I mix milk and water, equal parts, and a little over half as much meal, fine ground oats, as milk and water together, gradually decreasing the water to the end of the second week. Then I commenced to add a little tallow to the mixture, and gradually increased it. They had all the milk they would drink all summer, and when in the fattening coops were fed three times a day

LIST OF PRIZE WINNERS AT GUELPH, 1901.

Brahma—Light.

Cock.—1st, Geo. A. Tossy; 2nd, Hugh Wyatt; 3rd, Jno. Thomson.
Hen.—1st, T. J. Sheridan; 2nd, Thorpe & Scott; 3rd, Chas. B. Gould; 4th, Chas. B. Gould.
Cockerel.—1st, Chas. B. Gould; 2nd, Thorpe & Scott; 3rd, Geo. A. Tossy; 4th, Wm. R. Walker.
Pullet.—1st, Geo. A. Tossy; 2nd, Geo. A. Tossy; 3rd, Geo. A. Tossy; 4th, Wm. R. Walker.
Special.—Best male—Geo. A. Tossy. Best female. T. J. Sheridan.

Brahma—Dark.

Cock.—1st, G. A. Langelier; 2nd, A. Bogue; 3rd, Thorpe & Scott.
Hen.—1st, G. A. Langelier; 2nd, G. A. Langelier; 3rd, Thorpe & Scott.
Cockerel.—1st, L. C. Sage; 2nd, G. A. Langelier; 3rd, C. A. R. Tilt.
Pullet.—1st, L. C. Sage; 2nd, G. A. Langelier; 3rd, C. A. R. Tilt.
Special for best Dark Brahma hen and pullet, G. A. Langelier.
Special for best collection, G. A. Langelier. Special for best male, L. C. Sage.

Cochin—Buff.

Cock 1st, C. A. Stewart; 2nd, H. Wyatt; 3rd, H. Tozer.
Hen. 1st, C. A. Stewart; 2nd, H. Wyatt; 3rd, C. A Stewart.
Cockerel.—1st, H. Wyatt; 2nd, H. Wyatt; 3rd, C. A. Stewart.
Pullet.—1st, C. A. Stewart; 2nd, H. Wyatt; 3rd, C. A. Stewart.
Special for best collection, C. A. Stewart. Special for best hen, C. A. Stewart.

Cochin—Partridge.

Cock.—1st, R. Oke; 2nd, W. C. Wilson & Son; 3rd, Latta Bros.
Hen.—1st, Geo. J. White; 2od, Geo. J. White; 3rd, R. Oke.
Cockerel.—1st, H. Wyatt; 2nd, R Oke; 3rd, R. Oke.
Pullet.—1st, A. Bogue; 2od, H. Wyatt; 3rd, W. C. Wilson & Son.
Special for best Cockerel, H. Wyatt.

Cochin—Black.

Cock.—1st, Latta Bros.; 2nd, H. Emrick; 3rd, Latta Bros.
Hen.—1st, Latta Bros.; 2nd, Latta Bros.
Cockerel.—1st, Latta Bros.; 2nd, Latta Bros.
Pullet.—1st, Latta Bros.; 2nd, Latta Bros.
Special for best collection, Latta Bros.

Cochin—White.

Cock.—1st, Latta Bros.; 2nd, Latta Bros.
Hen.—1st, Latta Bros.; 2nd, H. Emrick; 3rd, H. Emrick.
Cockerel.—1st, Latta Bros.; 3rd, Latta Bros.
Pullet.—1st, Latta Bros.; 2nd, Latta Bros.
Special for best collection, Latta Bros.

Langshan—Black.

Cock.—1st, R. McCurdy; 2nd, G. A. Langelier; 3rd, E. J. Dewey.
Hen.—1st, G. A. Langelier; 2nd, H. Karn; 3rd, R. McCurdy.
Cockerel.—1st, G. A. Langelier; 2nd, R. McCurdy; 3rd, R McCurdy.
Pullet.—1st, G. A. Langelier; 2nd, R. McCurdy; 3rd, A. & T. Readwin.
Special for best hen, G. A. Langelier. Best Cockerel, G. A. Langelier. Best collection, G. A. Langelier.

Langshan—A.O.C.

Cock.—1st, A. Pfaff; 2nd, A. Pfaff; 3rd, M. T. Burn.
Hen.—1st, M. T. Burn; 2nd, A. Pfaff; 3rd, A. Pfaff.
Cockerel.—1st, A. Pfaff.
Pullet.—1st, A. Pfaff; 2nd, A. Pfaff; 3rd, M. T. Burn
Special for best pair, old, A. Pfaff. Special for best pair, young, A. Pfaff.

Plymouth Rock—Barred.

Cock.—1st, Wm. McLoud; 2nd, I. K. Millard; 3rd, N. Cosh & Co.; 4th, R. B. Millard.
Hen.—1st, I. K. Millard; 2nd, J. S. Jeffery; 3rd, Jas. McCormack; 4th, W. C. Fyfe.
Cockerel.—1st, W. C. Stagg; 2nd, N. Cosh & Co.; 3rd, W. C. Stagg; 4th, I. K. Millard.
Pullet.—1st, I. K. Millard; 2nd, J. S. Jeffery; 3rd, N. Cosh & Co.; 4th, W. C. Fyfe.
Special for best Barred Rock, I. K. Millard.
Special for best collection owned by member of Canadian Barred Rock Club, I. K. Millard.
Special for best male and three females—silver medal, to be won three times, I. K. Millard.
Special for best cock, hen, cockerel, pullet. Bertram trophy, I. K. Millard.

Plymouth Rock—White.

Cock.—1st, Oke & Andrews; 2nd, F. Bettscher; 3rd, W. H. Bessey; 4th, S. Kirby.
Hen.—1st, Mrs. W. R. C. Forester; 2nd, Mrs. W. R. C. Forester; 3rd, T. Rice; 4th, A G. Brown.
Cockerel.—1st, W. H. Bessey; 2nd, A. G. Brown; 3rd, Wm. Elliott; 4th, W. H. Bessey.
Pullet.—1st, Mrs. W. R. C. Forester; 2nd, T. Rice; 3rd, Mrs. W. R. C. Forester; 4th, Wm. Elliott.
Special for best cock, Oke & Andrews. Special for best female, Mrs. Forester.

PLYMOUTH ROCK—BUFF.

Cock.—1st, G. A. Jonson ; 2nd, J. H. Parsons ; 3rd, McKay Bros.
Hen.—1st, C. J. Daniels ; 2nd, McKay Bros. ; 3rd, T. H. Scott.
Cockerel.—1st, G. A. Jonson ; 2nd, Jno. Bawden ; 3rd, McKay Bros. ; 4th, T. H. Scott.
Pullet.—1st, G. A. Jonson ; 2nd, G. A. Jonson ; 3rd, T. H. Scott ; 4th, Jno. Bawden.
Special for three buff Rock Cockerels, G. A. Jonson. Special for best female, C. J. Daniels. Special for best shaped Plymouth Rock, W. H. Bessy.

WYANDOTTE—BUFF.

Cock.—1st, T. H. Scott ; 2nd, J. W. Saunders ; 3rd, T. H. Scott.
Hen.—1st, A. W. Graham ; 2nd, N. Cosh & Co. ; 3rd, J. W. Saunders.
Cockerel.—1st, N. Cosh & Co. ; 2nd, N. Cosh & Co. ; 3rd, Mrs. J. H. Shales ; 4th, T. H. Scott.
Pullet.—1st, N. Cosh & Co ; 2nd, N. Cosh & Co. ; 3rd, J. W. Saunders ; 4th, A. W. Graham.
Special for best Cockerel, N. Cosh & Co—Special for best collection by a person who has never shown before, J. W. Saunders. Special for best pair o'd, J. W. Saunders. Special for best buff Wyandotte or Rock male having purest wing, J. H. Parsons. Special for best Pullet, N. Cosh & Co.

WYANDOTTES—GOLDEN.

Cock.—1st, A. W. Graham ; 2nd, W. A. Greenfield ; 3rd, J. Barr ; 4th, A. W. Graham.
Hen.—1st, J. H. Magill ; 2nd, C. J. Daniels ; 3rd, A. W. Graham.
Cockerel.—1st, J. H. Magill ; 2nd, A. W. Graham ; 3rd, C. J. Daniels ; 4th, J. H. Magill.
Pullet.—1st, J. H. Magill ; 2nd, J. Barr ; 3rd, J. H. Magill 4th, A. W. Graham.
Special for best male, A. W. Graham.

WYANDOTTES—SILVER.

Cock.—1st, A. & T. Readwin ; 2nd, Jas. Arthur ; 3rd, S. W. Kinder.
Hen.—1st. J. E. Meyer . 2nd, G. J. Bogue ; 3rd, Jas. Arthur.
Cockerel.—1st, Jas. Arthur ; 2nd, Jas. Arthur ; 3rd, Jas. Arthur.
Pullet.—1st, Jas. Arthur ; 2nd. Jas. Arthur ; 3rd, Jas. Arthur ; 4th, W. R. Knight.
Special for best cock, A. & T. Readwin. Best cockerel, Jas. Arthur. Best female, Jas. Arthur.

WYANDOTTES—BLACK.

Cock.—1st, G. & J. Bogue ; 2nd, R. Oke ; 3rd, F. P. McDonnell.
Hen.—1st, G. & J. Bogue ; 2nd, G. & J. Bogue ; 3rd, T. J. Kiley.
Cockerel.—1st, Jas. Wedgery ; 2nd, E. Munroe ; 3rd, G. & J. Bogue.
Pullet.—1st, G. & J. Bogue ; 2nd, R. Oke ; 3rd, G. & J. Bogue.
Special for best cock, G. & J. Bogue.

WYANDOTTES—WHITE.

Cock.—1st, T. F. Kingsmill, jr. ; 2nd, C. Massie ; 3rd, N. T. Kettlewell ; 4th, Jas. A. Carroll.
Hen.—1st, Mrs. J. H. Shales ; 2nd, C. Massie ; 3rd, S. Kirby ; 4th N. T. Kettlewell.
Cockerel.—1st, Mrs. J. H Shales ; 2nd, T. F. Kingsmill, jr. ; 3rd, R. B Millard ; 4th, C. Massie.
Pullet.—1st, T. F. Kingsmill, jr. ; 2nd, N. T Kettlewell ; 3rd, J. S. Jeffery ; 4th, R. B. Millard ; 5th, C. Massie.
Special for best white Wyandotte cock, T. F. Kingsmill.
Special " " " cockerel, Mrs. Shales.
Special " " " pullet, T. F. Kingsmill.
Special " " " collection, T F. Kingsmill.
Special " shaped " any variety, T. F. Kingsmill.

DOMINIQUE.

Cock.—1st, M. T. Burn ; 2nd, A. Fink ; 3rd, G. & J. Bogue.
Hen.—1st, M. T. Burn ; 2nd, A. Fink ; 3rd, G. & J. Bogue.
Cockerel.—1st, G. & J. Bogue ; 2nd, A. Fink ; 3rd, M. T. Burn.
Pullet.—1st, M. T. Burn ; 2nd. A. Fink ; 3rd, G. & J. Bogue.

JAVA—BLACK.

Cock.—1st, Saugeen Poultry Yards ; 2nd. C. J. Daniels ; 3rd, Saugeen Poultry Yards.
Hen.—1st, G. & J. Bogue ; 2nd, W. R. Knight ; 3rd, R. Oke.
Cockerel.—1st M. T. Burn ; 2nd, G. & J. Bogue ; 3rd, C. J. Daniels;
Pullet.—1st, G. & J. Bogue ; 2nd, Saugeen Poultry Yards ; 3rd, C. J. Daniels.
Special for best collection, G. & J. Bogue.

JAVA—A. O. C.

Cock.—1st, Saugeen Poultry Yards ; 2nd, R. Oke ; 3rd. R. Oke.
Hen.—1st, R. Oke ; 2nd, Saugeen Poultry Yards ; 3rd, R. Oke.
Cockerel.—1st, T. J. Kiley ; 2nd. R. Oke ; 3rd, R. Oke.
Pullet.—1st. T. J. Kiley ; 2nd, R. Oke.
Special for best collection mottled Javas, R. Oke.

SPANISH.

Cock.—1st, W. K. Knight ; 2nd, Carling Bros. ; 3rd, W. E. Wright.
Hen.—1st, W. R. Knight ; 2nd, Carling Bros. ; 3rd. W. E. Wright.
Cockerel.—1st, M. T. Burn ; 2nd, G. & J. Bogue ; 3rd, Carling Bros.
Pullet.—1st, G. & J. Bogue ; 2nd, Carling Bros. ; 3rd. Carling Bros.
Special for best male, W. R. Knight. Special for best female, G. & J. Bogue.

MINORCAS—BLACK.

Cock—1st, Hugh Munroe; 2nd, E. R. Frith
Hen—1st, E. R. Frith; 2nd, Hugh Munroe; 3rd, E. R. Frith.
Cockerel—1st, E. R Frith; 2nd, E. R Frith; 3rd, E. R. Frith; 4th, Mrs. J. H. Shales.
Pullet—1st L. V Zavitz; 2nd, Hugh Munroe; 3rd, E. R Frith.
Special for best male, E. R. Frith. Special for best female, E. R. Frith.

MINORCAS—WHITE.

Cock—1st, Jas. O'Neil.
Hen—1st, Jas. O'Neil; 2nd, Jas. O Neil.
Special for best collection, Jas. O'Neil.
Pullet—1st, Jas. O'Neil; 2nd, Jas. O'Neil.
Cockerel—1st, Jas. O'Neil; 2nd, Jas. O'Neil.

ANDALUSIAN.

Cock.—1st, N. Cosh & Co.; 2nd, N. Cosh & Co.; 3rd, N. Cosh & Co.
Hen.—1st, N. Cosh & Co; 2nd. N. Cosh & Co.; 3rd, N. Cosh & Co.
Cockerel.—1st, N. Cosh & Co.; 2nd, N Cosh & Co.; 3rd, N. Cosh & Co.
Pullet—1st, N. Cosh & Co.; 2nd, W. R. Knight; 3rd, Fred Washburn.
Special for best collection, N. Cosh & Co.
Special for best hen, N. Cosh & Co.
Special for best collection, med., N. Cosh & Co.

WHITE LEGHORN—R.C.

Cock—1st, Jas. Masson; 2nd, Jas. Masson; 3rd, R. Oke.
Hen.—1st, W. J. Bell; 2nd, R Oke; 3rd, W. J. Bell.
Cockerel.—1st, Wm. A. Rife; 2nd, Wm A. Rife; 3rd, Jas. Masson,
Pullet.—1st, W. J. Bell; 2nd, W. J. Bell, 3rd, R. Oke.
Special for best collection, W. J. Bell.

WHITE LEGHORN—S.C.

Cock.—1st, Jno. Ramsay; 2nd, Thos. Rice; 3rd, F. Wixon.
Hen.—1st, Thos. Rice; 2nd, F. Wixson; 3rd, F. Wixson.
Cockerel.—1st, Jno. Ramsay; 2nd, J. S. Jeffery; 3rd, Jno. Ramsay; 4th, Thos. Rice.
Pullet.—1st, Thos. Rice; 2nd. Thos. Rice; 3rd, F. Wixson; 4th, F. Wixson.
Special for best pair, Thos. Rice. Male, J. Ramsay. Pullet, Thos. Rice.

LEGHORN—BLACK.

Cock.—1st, Geo. Colwell; 2nd, Jos. Grundy; 3rd, W. R. Knight.
Hen.—1st, A. G. Brown; 2nd, C. J. Daniels; 3rd, W. R. Knight.
Cockerel.—1st, C. J. Daniels; 2nd. Jos. Grundy; 3rd, Jos. Grundy.
Pullet.—1st, Jos. Grundy; 2nd, Jos. Grundy; 3rd, Jos. Grundy.
Special for best collection, young, Jos. Grundy.

BROWN LEGHORN—R.C.

Cock.—1st, H. Tozer; 2nd, William Cadman.
Hen.—1st, H. Tozer; 2nd, Saugeen Poultry Yards; 3rd, Saugeen Poultry Yards.
Cockerel.—1st, Wm. Cadman; 2nd, Wm. Cadman; 3rd, W. C. Wilson & Son.
Pullet.—1st. H. Tozer; 2nd. H. Tozer; 3rd, W. C. Wilson & Son.
Special for best male, Wm. Cadman. Female, H. Tozer.

BROWN LEGHORN—S.C.

Cock.—1st, Dewar Bros.; 2nd, Jno. Pletsch; 3rd, G. G. Henderson.
Hen.—1st, G. G Henderson; 2nd, Dewar Bros.; 3rd, Dewar Bros.
Cockerel.—1st, T. Rice; 2nd, T J. Sheridan; 3rd, Dewar Bros.
Pullet.—1st, Dewar Bros.; 2nd, G. G. Henderson; 3rd, Dewar Bros.; 4th G. G. Henderson.
Special for best shaped Leghorn, any variety, John Ramsay. Special for best pair, Dewar Bros.

LEGHORN—BUFF.

Cock.—1st, Spry & Mick; 2nd, Spry & Mick; 3rd, Geo. Whillans.
Hen.—1st, G. Berner; 2nd, Spry & Mick; 3rd, Geo. Whillans.
Cockerel.—1st, Geo. Whillans; 2nd, G. Berner; 3rd, N. K. Cornwall; 4th, P. H. Roos.
Pullet.—1st, Good & Harron; 2nd, N. K. Cornwall; 3rd, Jas. Dundas; 4th, Geo. Whillans.
Special for best pullet, Good & Harron. Male, G. W. Whillans. Pair pullets, Geo. Whillans.

DORKING—SILVER GREY.

Cock.—1st, A. Bogue; 2nd, S. D. Furminger; 3rd, M. T. Burn.
Hen.—1st, Jno. McKee, 2nd, G. & J. Bogue; 3rd, M. T. Burn.
Cockerel.—1st, A. Bogue; 2nd, A. Bogue; 3rd, Geo. J. White.
Pullet.—1st A. Bogue; 2nd, Jas. McCormack; 3rd, Geo. J. White.

DORKING—COLORED.

Cock.—1st, A. Bogue ; 2nd, A. Bogue ; 3rd, Jas. McCormack.
Hen.—1st, A. Bogue ; 2nd, Jas. McCormack ; 3rd, A. Bogue.
Cockerel.—1st, A. Bogue ; 2nd, A. Bogue.
Pullet.—1st, A. Bogue ; 2nd, A. Bogue ; 3rd, Jas. McCormack.

DORKING—WHITE.

Cock.—1st, A. Bogue ; 2nd, A. Bogue ; 3rd, Mrs. J. Ross.
Hen.—1st, A. Bogue ; 2nd, A. Bogue ; 3rd, Mrs. J. Ross.
Cockerel —1st, A. Bogue ; 2nd, A. Bogue ; 3rd, Mrs J. Ross.
Pullet.—1st, A. Bogue ; 2nd, A. Bogue ; 3rd, Mrs. J. Ross.
Special for best collection, A. Bogue.

POLAND—W.C.B.

Cock.—1st, William McNeil ; 2nd, A. Bogue.
Hen.—1st, William McNeil ; 2nd, A. Bogue.
Cockerel.—1st, A. Bogue ; 2nd, William McNeil.
Pullet.—1st, William McNeil ; 2nd, A. Bogue.
Special for best cockerel, A. Bogue.

POLAND—GOLDEN.

Cock.—1st, A. Bogue ; 2nd, Wm. McNeil.
Hen.—1st, A. Bogue ; 2nd, Wm. McNeil.
Cockerel.—1st, G. & J. Bogue ; 2nd, Wm. McNeil.
Pullet.—1st, Wm. McNeil ; 2nd, G. & J. Bogue.
Special for best collection, Wm. McNeil.

POLAND—SILVER.

Cock.—1st, M. T. Burn ; 2nd, M. T. Burn.
Hen.—1st, M. T. Burn ; 2nd, M. T. Burn.
Cockerel.—1st, M. T. Burn ; 2nd, M. T. Burn.
Pullet.—1st, M. T. Burn ; 2nd, M. T. Burn.
Special for best collection, M. T. Burn.

POLAND—WHITE.

Cock.—1st, Wm. McNeil ; 2nd, A. Bogue.
Hen.—1st, Wm. McNeil ; 2nd, A. Bogue.
Cockerel.—1st, A. Bogue ; 2nd, Wm. McNeil.
Pullet.—1st, Wm. McNeil ; 2nd, A. Bogue.
Special for best collection, Wm. McNeil.

POLAND—GOLDEN-BEARDED.

Cock.—1st, A. Bogue ; 2nd, Wm. McNeil.
Hen.—1st, Wm. McNeil ; 2nd, A. Bogue.
Cockerel.—1st, A. Bogue ; 2nd, Wm. McNeil.
Pullet.—1st, Wm. McNeil ; 2nd, A. Bogue.
Special for best collection, W. McNeil.

POLAND—SILVER-BEARDED.

Cock—1st, A. Bogue ; 2nd, Wm. McNeil.
Hen.—1st, Wm. McNeil ; 2nd, A. Bogue.
Cockerel.—1st, Wm. McNeil ; 2nd, A. Bogue.
Pullet—1st, A. Bogue ; 2nd, Wm. McNeil.
Special for best collection, A. Bogue.

POLAND—WHITE-BEARDED.

Cock—1st, Wm. McNeil ; 2nd, A. Bogue.
Hen—1st, Wm McNeil ; 2nd, A. Bogue.
Cockerel—1st, Wm. McNeil ; 2nd, A. Bogue.
Pullet—1st, Wm. McNeil ; 2nd, A. Bogue.
Special for best collection, Wm. McNeil.

POLAND—BUFF-LACED.

Cock—1st, and 2nd, Wm. McNeil.
Hen—1st, 2nd, and 3rd, Wm. McNeil.
Cockerel—1st, Wm. McNeil.
Pullet—1st, 2nd, and 3rd, Wm. McNeil.
Special for best collection, Wm. McNeil.

HAMBURGS—G. S.

Cock—1st, Wm. McNeil ; 2nd, R. Oke.
Hen—1st, Wm. McNeil ; 2nd, R. Oke.
Cockerel—1st, Wm. McNeil ; 2nd, R. Oke.
Pullet—1st, Wm. McNeil ; 2nd, R. Oke.
Special for best collection, Wm. McNeil.

HAMBURGS—S. P.

Cock—1st, R. Oke.
Hen—1st, R. Oke.
Cockerel—1st, R. Oke.
Pullet—1st, R. Oke.
Special for best collection, R. Oke.

HAMBURGS—G. P.

Cock—1st, R. Oke ; 2nd, Wm. McNeil ; 3rd, A. Bogue.
Hen—1st, R. Oke ; 2nd, Wm. McNeil.
Cockerel—1st. R. Oke ; 2nd, Wm. McNeil.
Pullet—1st, R. Oke ; 2nd, Wm. McNeil.
Special for best collection, R. Oke.

HAMBURGS—S. S.

Cock—1st, R. Oke ; 2nd, A. Bogue ; 3rd, Wm. McNeil.
Hen—1st, R. Oke ; 2nd, Wm. McNeil.
Cockerel—1st, A. Bogue ; 2nd, Wm. McNeil.
Pullet—1st, Wm. McNeil ; 2nd, R. Oke.
Special for best collection, R. Oke.

HAMBURG—BLACK.

Cock—1st, Wm. McNeil ; 2nd, R. Oke.
Hen—1st, R. Oke ; 2nd, Wm. McNeil.
Cockerel— 1st, Wm. McNeil ; 2nd, H. Tozer ; 3rd, R. Oke.
Pullet—1st, Wm. McNeil; 2nd, R. Oke ; 3rd, H. Tozer.
Special for best collection, Wm. McNeil.

RED CAP.

Cock—1st, C. J. Daniels ; 2nd, G. W. Kinder ; 3rd, G. & J. Bogue.
Hen—1st, C. J. Daniels ; 2nd, G. W. Kinder ; 3rd, G. & J. Bogue.
Cockerel—1st, C. J. Daniels ; 2nd, G. W. Kinder ; 3rd, W. E. Wright.
Pullet—1st, G. W. Kinder ; 2nd, C. J. Daniels ; 3rd, G. & J. Bogue.

HOUDAN.

Cock—1st, D. C. Trew ; 2nd, D. C. Trew ; 3rd, A. Bogue.
Hen—1st, D. C. Trew ; 2nd, D. C. Trew ; 3rd, D. C. Trew.
Cockerel—1st, G. & J. Bogue ; 2nd, D. C. Trew ; 3rd, M. T. Burn.
Pullet—1st, D. C. Trew ; 2nd, M. T. Burn ; 3rd, D. C. Trew.
Special for best collection, D. C. Trew.

CREVE-COEURS.

Cock.—1st, G. & J. Bogue ; 2nd, R. Oke.
Hen.—1st, R. Oke ; 2nd, G. & J. Bogue.
Cockerel.—1st, R. Oke.
Pullet.—1st, R. Oke ; 2nd, G. & J. Bogue.
Special for best collection, R. Oke.

LAFLECHE.

Cock.—1st, R. Oke ; 2nd, R. Oke.
Hen.—1st, R. Oke ; 2nd, G. & J. Bogue.
Cockerel.—1st, R. Oke ; 2nd, G. & J. Bogue.
Pullet—1st, R. Oke.
Special for best collection, R. Oke.
Special for best collection, French, R. Oke.

SULTAN.

Cock—1st, R. Oke.
Hen—1st, R. Oke.
Cockerel—1st, R. Oke ; 2nd, R. Oke.
Pullet—1st, R. Oke ; 2nd, R. Oke.
Special for best collection, R. Oke.

ORPINGTON.

Cock—1st, W. K. Kerr ; 2nd, C. F. Wagner ; 3rd, S. D. Furminger.
Hen—1st, W. K. Kerr ; 2nd, S. D. Furminger ; 3rd, C. F. Wagner.
Cockerel—1st, W. K. Kerr ; 2nd, S. W. D. Frith ; 3rd, P. H. Roos ; 4th, W. K. Kerr.
Pullet—1st, P. H. Roos ; 2nd, W. K. Kerr ; 3rd, C. F. Wagner ; 4th, W. K. Kerr.
Special for best buff male, W. K. Kerr. Special for best buff female, P. H. Roos.

A. O. V.

Cock—1st, Wm. McNeil ; 2nd, H. B. Donavan ; 3rd, M. T. Burn.
Hen—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, H. B. Donovan.
Cockerel—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, S. D. Furminger.
Pullet—1st, Jno. Innes; 2nd, M. T. Burn ; 3rd, S. D. Furminger.
Special for best collection, W. McNeil—Special for best Partridge Wyandotte male, T. H. Scott—Special for best Partridge Wyandotte female, T. H. Scott. Special for best two cockerels and two pullets in Rocks, Wyandottes or Orpingtons, J. Arthur, on Silver Wyandottes—Special for best cock, hen, cockerel and pullet in Rocks, Wyandottes or Orpingtons owned in County of Wellington, A. & T. Readwin. Special for largest exhibit in Polish, Hamburgs, American or Mediterranean classes, etc , W. McNeil.

CROSS BRED.

Cockerel—1st, J. H. Parsons ; 2nd, Geo. Colwell ; 3rd, A. & T. Readwin.
Pullet—1st, J. H. Parsons ; 2nd, M. Wilson ; 3rd, A. & T. Readwin.

GAME—BLACK RED.

Cock—1st, Wm. Barber ; 2nd, Jas. Morley ; 3rd, Jno. Philpot.
Hen—1st, Wm. Barber ; 2nd, Jno. Crowe ; 3rd, Jno. Crowe.
Cockerel—1st, Jno. Crowe ; 2nd, Jas. Morley ; 3rd, Jno. Philpot ; 4th, Wm. Barber.
Pullet—1st, R. H. Barber ; 3nd, Jno. Crowe ; 3rd, E. F. Earl ; 4th, Jno. Roberts.
Special for best collection, Jno. Crowe.

GAME—BR. RED.

Cock.—1st, Jno. Crowe ; 2nd, Wm. Barber ; 3rd, Jno. Crowe.
Hen.—1st, H. Sallows ; 2nd, Jno. Crowe ; 3rd, Wm. Barber.
Cockerel.—1st, Wm. Barber ; 2nd, H. Sallows ; 3rd, Jno. Crowe.
Pullet.—1st, Jno. Crowe ; 2nd, Wm. Barber ; 3rd, Jno. Crowe.
Special for best collection, Jno. Crowe. Best male, Jno. Crowe. Best female, H. Sallow.

GAME—DUCKWING.

Cock.—1st, Wm. Barber ; 2nd, Geo. Colwell ; 3rd, L. C. Sage.
Hen.—1st, Wm. Barber ; 2nd, M. T. Burn.
Cockerel.—1st, Wm. Barber ; 2nd, Wm. Barber ; 3rd, Geo. Colwell.
Pullet.—1st, Wm. Barber ; 2nd, M. T. Burn ; 3rd, Wm. Barber.
Special for best collection, Wm. Barber. Special for best Golden Duckwing cock, Wm. Barber.

GAME—PYLE.

Cock.—1st, R. H. Barber ; 2nd, Jno. Crowe ; 3rd, R. H. Barber.
Hen.—1st, Wm. Barber & Co. ; 2nd, Jno. Crowe ; 3rd, Jno. Crowe.
Cockerel.—1st, Jno. Crowe ; 2nd, M. T. Burn ; 3rd, R. H. Barber.
Pullet.—1st, Jno. Crowe ; 2nd, Wm. Barber ; 3rd, Geo. Vance.
Special for best male, R. H. Barber. For best collection standard games, all varieties, Wm. Barber.
Special for best exhibition game male, Jno. Crowe.

GAME—INDIAN.

Cock.—1st, Jno. Modlin ; 2nd, J. H. Parsons ; 3rd, W. J. Teale & Co.
Hen.—1st, Jno. Modlin ; 2nd, J. H. Parsons ; 3rd, J. H. Parsons.
Cockerel.—1st, J. H. Parsons ; 2nd. E. A. Hales ; 3rd, J. H. Parsons.
Pullet—1st, J. H. Parsons ; 2od, J. H. Parsons ; 3rd, J. H. Parsons.
Special for best cock, J. Modlin. Special for best female, J. Modlin.
Special for best cockerel shown by member L. P. A., J. A. Carrol.

GAME—A. O. S. V.

Cock.—1st, C. J. Daniels ; 2nd, M. T. Burn ; 3rd, A. Patten.
Hen.—1st, J. H. Parsons : 2nd, C. J. Daniels ; 3rd, M. T. Burn.
Cockerel—1st, M. T. Burn ; 2nd, A. Patten ; 3rd, A. Patten.
Pullet—1st, J. H. Parsons ; 2nd, M. T. Burn : 3rd, A. Patten.

GAME BANTAM—B. B. RED.

Cock—1st, Wm. Barber & Co.; 2nd, Wm. Barber & Co.; 3rd, Chas. R. Crowe.
Hen.—1st, Oakwood Farm ; 2nd, Wm. Barber & Co.; 3rd, Chas. R. Crowe.
Cockerel.—1st, Chas. R. Crowe ; 2nd, Wm. Barber & Co.; 3rd, Chas. R. Crowe ; 4th, Chas. R. Crowe.
Pullet.—1st A. W. Tyson ; 2nd, Chas. R. Crowe ; 3rd, Chas. R. Crowe ; 4th, Wm. Barber & Co.
Special for best male, Wm. Barker. Special for best female, Oakwood Farm.

GAME BANTAM—BR. RED.

Cock.—1st, Wm. Hammall ; 2nd, Jas. McCormack ; 3rd, Wm. Barber.
Hen.—1st, S. D. Furminger ; 2nd, Wm. Barber ; 3rd, Jas. McCormick.
Cockerel—1st, Wm. Barber.
Pullet.—1st, Wm. Barber ; 2nd, C. R. Crowe ; 3rd, H. Tozer

GAME BANTAM—DUCKWING.

Cock.—1st, T. J. Kiley ; 2nd, Wm. Barber & Co.; 3rd, Chas. R. Crowe.
Hen.—1st, Wm. Barber & Co.; 2nd, Chas. R. Crowe ; 3rd, T. J. Kiley.
Cockerel.—1st, Wm. Barber & Co.; 2nd, Geo. Colwell ; 3rd, Wm. Barber & Co.
Pullet.—1st, Wm. Barber & Co.; 2nd, T. J. Kiley ; 3rd, Wm. Barber & Co.
Special for best cockerel, Wm. Barber & Co.

GAME BANTAM—PYLE.

Cock.—1st, Chas. R. Crowe ; 2nd, Wm. Hammall ; 3rd, Wm. Barber & Co.
Hen.—1st, Wm. Barber & Co.; 2nd, Chas. R. Crowe ; 3rd, Mrs. J. H. Shales.
Cockerel.—1st, Chas. R. Crowe ; 2nd, James Bertie ; 3rd, James Bertie.
Pullet.—1st, Chas. R. Crowe ; 2nd, James Bertie ; 3rd, A. W. Tyson.
Special for best male, Charles Crowe. Special for best female, Wm. Barber.

GAME BANTAM—A. O. V.

Cock.—1st, Wm. Hammall ; 2nd, H. B. Donovan ; 3rd, H. B. Donovan.
Hen.—1st, H. B. Donovan ; 2nd, Wm. Hammall ; 3rd, H. B. Donovan.
Cockerel.—1st, S. D. Furminger ; 2nd, Wm. Hammall ; 3rd, H. B. Donovan.
Pullet.—1st, H. B. Donovan ; 2nd, H. B. Donovan ; 3rd, S. D. Furminger.

SEABRIGHT BANTAM—GOLDEN.

Cock—1st, R. Oke ; 2nd, Wm. McNeil.
Hen.—1st, R. Oke ; 2nd, Wm. McNeil.
Cockerel.—1st, R. Oke ; 2nd, Wm. McNeil.
Pullet.—1st, R. Oke ; 2nd, McNeil.
Special for best collection, R. Oke.

SEABRIGHT BANTAM—SILVER.

Cock.—1st, Wm. McNeil ; 2nd, R. Oke ; 3rd, John Thomson.
Hen.—1st, R. Oke ; 2nd, Wm. McNeil ; 3rd, John Thomson.
Cockerel.—1st, Wm. McNeil ; 2nd, R. Oke ; 3rd, John Thomson.
Pullet.—1st, R. Oke ; 2nd, McNeil ; 3rd, John Thomson.
Special for best collection, R. Oke.

BANTAM—ROSE COMB.

Cock.—1st, Wm. McNeil; 2nd, R. Oke.
Hen.—1st, Wm. McNeil; 2nd, R. Oke.
Cockerel.—1st, Wm. McNeil; 2nd, R. Oke; 3rd, W. J. Teale & Co.
Pullet.—1st, R. Oke; 2nd, Wm. McNeil; 3rd, W. J. Teale & Co.
Special for best collection, Wm. McNeil.

COCHIN BANTAM—WHITE.

Cock.—1st, Wm. McNeil; 2nd, Wm. McNeil; 3rd, Geo. Colwell.
Hen.—1st, Wm. McNeil; 2nd, George Colwell; 3rd, H. B. Donovan.
Cockerel.—1st, Wm. McNeil; 2nd, H. B. Donovan; 3rd, Wm. McNeil.
Pullet.—1st, H. B. Donovan; 2nd, Wm. McNeil; 3rd, Geo. Colwell.
Special for best collection, Wm. McNeil.

COCHIN BANTAMS—BUFF.

Cock.—1st, Wm. McNeil; 2nd, R. Oke.
Hen.—1st, Wm. McNeil; 2nd, R. Oke; 3rd, W. J. Teale.
Cockerel.—1st, Wm. McNeil; 2nd, R. Oke; 3rd, H. B. Donovan.
Pullet.—1st, Wm. McNeil; 2nd, R. Oke; 3rd, H. B. Donovan.
Special for best collection, Wm. McNeil.

COCHIN BANTAM—A. O. V.

Cock.—1st, Charles S. Webber; 2nd, T. J. Kiley; 3rd, T. J. Kiley.
Hen.—1st, T. J. Kiley; 2nd, Chas S. Webber; 3rd, H. B. Donovan.
Cockerel.—1st, T. J. Kiley; 2nd, T. J. Kiley; 3rd, H. Tozer.
Pullet.—1st, T. J. Kiley; 2nd, T. J. Kiley; 3rd, W. J Teale.
Special for best collection, T. J. Kiley. Special for best female, T. J. Kiley.
Special for best partridge cochin bantam pullet, W. J. Teale.

BOOTED BANTAM—WHITE.

Cock.—1st, H. B. Donovan.
Hen.—1st, R. Oke; 2nd, H. B. Donovan.
Cockerel.—1st, H. B. Donovan; 2nd, R. Oke.
Pullet.—1st, R. Oke; 2nd, H. B. Donovan.
Special for best collection white booted bantams, H. B. Donovan.

JAPANESE BANTAMS—BLACK TAILED.

Cock.—1st, R. Oke; 2nd, Wm. McNeil.
Hen.—1st, Wm. McNeil; 2nd, R. Oke.
Cockerel.—1st, M. T. Burn; 2nd, Wm. McNeil; 3rd, R. Oke.
Pullet.—1st, R. Oke; 2nd, Wm. McNeil; 3rd, M. T. Burn.
Special for best collection, R. Oke

BAMTAM—POLISH.

Cock.—1st, Wm. McNeil; 2nd, H. B. Donovan.
Hen.—1st, H. B. Donovan; 2nd, R. Oke; 3rd, Wm. McNeil.
Cockerel.—1st, Wm. McNeil; 2nd, H. B. Donovan; 3rd, R. Oke.
Pullet.—1st, Wm. McNeil; 2nd, H. B. Donovan; 3rd, R. Oke.
Special for best collection, Wm. McNeil.

BANTAM—A. O. V.

Cock.—1st, M. T. Burn; 2nd, R. Oke; 3rd, Wm. McNeil.
Hen.—1st, M. T. Burn; 2nd, H. B. Donovan; 3rd, R. Oke.
Cockerel.—1st, R. Oke; 2nd, Wm. McNeil; 3rd, C. J. Eisele.
Pullet.—1st, Wm. McNeil; 2nd, H. B. Donovan; 3rd, R. Oke.
Special for best collection white Japanese, R. Oke.
Special for best surface colored buff male in show, all buffs competing, C. A. Jonson.
Special for best surface colored buff female in show, all buffs competing, C. A. Stewart.

TURKEYS—BRONZE—TWO YEARS AND UPWARDS.

Cock.—1st, W. J. Bell; 2nd, A. McDougal; 3rd, A. Beattie.
Hen.—1st, W. H. Beattie; 2nd, W. J. Bell; 3rd, W. R. Knight.

TURKEY—BRONZE—ONE YEAR AND UNDER TWO.

Cock.—1st, A. McDougal & Son; 2nd, Cullis & Lean; 3rd, W. H. Beattie.
Hen.—1st, A. McDougal & Son; 2nd, W. H. Beattie; 3rd, W. J. Bell.

BRONZE TURKEY, 1901.

Cockerel.—1st, W. J. Bell; 2nd, A. McDougal & Son; 3rd, W. H. Beattie.
Pullet.—1st, W. J. Bell; 2nd, A. McDougal & Son; 3rd, W. H. Beattie.

WHITE OR BLACK TURKEY.

Cock.—1st, W. H. Beattie; 2nd, Geo. Colwell; 3rd, W. H. Beattie.
Hen.—1st, W. H. Beattie; 2n H. Beattie; 3rd, Saugeen Poultry Yards.

WHITE OR BLACK TURKEY, 1901.

Cockerel.—1st, W. H. Beattie ; 2nd, W. H. Beattie.
Pullets.—1st, W. H. Beattie ; 2nd, W. H. Beattie.
Special for best white turkey cock, W. H. Beattie.
Special for best collection, W. H. Beattie.

TURKEY—A. O. V.

Cock.—1st, A. G. H. Luxton ; 2nd, W. H. Beattie.
Hen.—1st, A. G. H. Luxton ; 2nd, W. H. Beattie ; 3rd, W. H. Beattie.
Cockerel.—1st, W. H. Beattie.
Pullet.—1st, A. G. H. Luxton : 2nd, W. H. Beattie.

GEESE—TOULOUSE.

Gander.—1st, A. Bogue ; 2nd, Geo. Colwell ; 3rd, Geo. Colwell.
Goose.—1st, Geo. Colwell ; 2nd, Geo. Colwell ; 3rd, A. Bogue.

TOULOUSE, 1901.

Gander.—1st, Geo. Colwell ; 2nd, Geo. Colwell ; 3rd, Geo. Colwell.
Goose.—1st, Geo. Colwell ; 2nd, Geo. Colwell ; 3rd, Geo. Colwell.
Special for best collection, Geo. Colwell.

GEESE—BREMEN.

Gander.—1st. Geo. Colwell ; 2nd, Geo. Colwell ; 3rd, Geo. Colwell.
Goose.—1st, Geo. Colwell ; 2nd, Geo. Colwell ; 3rd, C. A. R. Tilt.

GEESE—BREMEN, 1901.

Gander.—1st, Geo. Colwell ; 2nd, Geo. Colwell ; 3rd, Geo. Colwell.
Goose.—1st. Geo. Colwell ; 2nd, Geo. Colwell ; 3rd, C. A. P. Tilt.
Special for best collection, Geo. Colwell.

GEESE—A. O. V.

Gander.—1st, Geo. Colwell ; 2nd, M. T. Burn ; 3rd, C. E. Smith,
Goose.—1st, Geo. Colwell ; 2nd, Geo. Colwell ; 3rd, M. T. Burn.

DUCK—AYLESBURY.

Drake.—1st, A. Bogue ; 2nd, Geo. Colwell ; 3rd, Geo. Colwell.
Duck.—1st, A. Bogue ; 2nd, Geo. Colwell ; 3rd, Geo. Colwell.

DUCK—1901, AYLESBURY.

Drake.—1st. Geo. Colwell ; 2nd, Geo. Colwell.
Duck.—1st, Geo. Colwell ; 2nd, Geo. Colwell ; 3rd, A. Bogue.
Special for Aylesbury duck, A. Bogue.

DUCK—ROUEN.

Drake.—1st, Geo. Colwell ; 2nd, M. T. Burn ; 3rd, W. R. Knight.
Duck.—1st, A. Bogue ; 2nd, M. T. Burn ; 3rd, W. R. Knight.

DUCK—1901, ROUEN.

Drake.—1st, M. T. Burn ; 2nd, A. Bogue ; 3rd, Geo. Colwell.
Duck.—1st, M. T. Burn ; 2nd, Geo. Colwell ; 3rd, Geo. Colwell.
Special for best collection, M. T. Burn.

DUCK—PEKIN.

Drake.—1st, Geo. Colwell ; 2nd, C. A. R. Tilt ; 3rd, Geo. Colwell.
Duck.—1st, Geo. Colwell ; 2nd, A. Bogue ; 3rd, Geo. Colwell.

DUCK—1901, PEKIN.

Drake.—1st, Geo. Colwell ; 2nd, A. Bogue ; 3rd, C. A. R. Tilt.
Duck.—Geo. Colwell ; 2nd, C. A. R. Tilt ; 3rd, Geo. Colwell.
Special for best collection, Geo. Colwell.

DUCK—A. O. V.

Drake.—1st, Jas. McCormack ; 2nd, I. T. Knight ; 3rd, M. T. Burn.
Duck.—1st, G. & J. Bogue ; 2nd, I. T. Knight ; 3rd, Jas. McCormack.

DUCK—1901, A. O. V.

Drake.—1st. G. & J. Bogue ; 2nd, Jas. McCormack ; 3rd, M. T. Burn.
Duck.—1st, G. & J. Bogue ; 2nd, I. T. Knight ; 3rd, Jno. Colson.
Special for best collection ducks, all varieties, G. Colwell.
Special for best Cayuga drake, G. & J. Bogue.
Special for best Cayuga duck, G. & J. Bogue.
Special for best collection Cayuga (pair old and young), G. &. J. Bogue.
Special for best collection Indian runners, Jno. Colson.

ENGLISH PHEASANTS, PAIR.

1st, H. B. Donovan ; 2nd, L. V. Ludwig : 3rd, M. T. Burn.

PAIR GOLDEN PHEASANTS.

1st, M. T. Burn ; 2nd, H. B. Donovan ; 3rd, L. V. Ludwig.

PAIR SILVER PHEASANTS.

1st, M. T. Burn ; 2nd, H. B. Donovan.

PAIR A. O. V. PHEASANTS.

1st, M. T. Burn.

PIGEONS.—CARRIER.—BLACK.

Cock.—1st, J. H. Baulch ; 2nd, J. H. Baulch. *Hen.*—1st, J. H. Baulch ; 2nd, G. W. Nahrgang.

DUN—CARRIER.

Cock.—1st, H. B. Donovan ; 2nd, G. W. Nahrgang. *Hen.*—1st, G. W. Nahrgang ; 2nd, G. J. White.

CARRIER—A. O. S. C.

Cock.—1st, G. J. White ; 2nd, J. H. Baulch. *Hen.*—1st, J. H. Baulch ; 2nd, G. J. White.

WHITE POUTER.

Cock.—1st, G. W. Nahrgang ; 2nd, R. Henry. *Hen.*—1st, R. Henry.

BLUE PIED POUTER.

Cock.—1st, J. H. Magill ; 2nd, J. H. Magill. *Hen.*—1st, J. H. Magill ; 2nd, J. H. Magill.

BLACK PIED POUTER.

Cock.—1st, J. H. Magill ; 2nd, J. H. Magill. *Hen.*—1st, J. H. Magill ; 2nd, J. H. Magill.

YELLOW OR RED POUTER.

Cock.—1st, J. H. Magill ; 2nd, J. H. Magill. *Hen.*—1st, J. H. Magill ; 2nd, J. H, Magill.
Special for best Pouter, J. H. Magill.

S. F. TUMBLER.

Cock.—1st, H. B. Donovan ; 2nd, H. B. Donovan. *Hen.*—1st, H. B. Donovan ; 2nd, H. B. Donovan.

A. O. V. TUMBLER.

Cock.—1st, H. B. Donovan ; 2nd, W. H. Tytler. *Hen.*—1st, H. B. Donovan ; 2nd, M. T. Burn.

RED BARB.

Cock.—1st, G. J. White ; 2nd, W. J. Teale & Co. *Hen.*—1st, H. B. Donovan ; 2nd, G. J. White.

BLACK BARB.

Cock.—1st, G. W. Nahrgang ; 2nd, W. J. Teale & Co. *Hen.*—1st, G. W. Nahrgang ; 2nd. W. J. Teale & Co.

A. O. S. C. BARB.

Cock—1st, G. W. Nahrgang ; 2nd, G. J. White. *Hen.*—1st, G. W. Nahrgang ; 2nd, G. W. Nahrgang.
Special for best Barb, H. B. Donovan.

WHITE TRUMPETER.

Cock.—1st, J. H. Baulch ; 2nd, J. H. Baulch. *Hen.*—1st, J. H. Baulch ; 2nd, J. H. Baulch.

A. O. S. C. TRUMPETER.

Cock.—1st, J. H. Baulch ; 2nd, J. H. Baulch. *Hen.*—1st, J. H. Baulch ; 2nd, J. H. Baulch.

RED OR YELLOW JACOBIN.

Cock.—1st, Chas. Massie ; 2nd, Chas. Massie. *Hen.*—1st, Chas. Massie ; 2nd, Chas. Massie.

WHITE JACOBIN.

Cock.—1st, Chas. Massie ; 2nd, Chas. Massie. *Hen.*—1st Chas. Massie ; 2nd, Chas. Massie.

JACOBIN.—A. O. S. C.

Cock.—1st, C. Massie ; 2nd, C. Massie.
Hen.—1st, C. Massie ; 2nd, C. Massie.
Special for best pair Jacobins, C. Massie.

Special for best pair Jacobins shown by youngest London exhibitor, J. W. Saunders.

ANTWERP R.C.

Cock.—1st. H. B. Donovan ; 2nd, H. B. Donovan. *Hen.*—1st, H. B. Donovan ; 2nd, H. B. Donovan.

ANTWERP—SILVER DUN.

Cock.—1st, H. B. Donovan ; 2nd, H. B. Donovan, *Hen.*—1st, H. B. Donovan ; 2nd, H. B. Donovan.

WHILE FANTAIL.

Cock.—1st, G. W. Nahrgang ; 2nd. C. Massie. *Hen.*—1st, C. Massie ; 2nd, N. D. McPhie.

BLUE FANTAIL.

Cock.—1st, M. T. Burn ; 2nd, N. D McPhie. *Hen.*—1st, N. D. McPhie ; 2nd, M. T. Burn.

A. O. S. C. FANTAIL.

Cock.—1st, M. T. Burn ; 2nd, G. W. Nahrgang. *Hen.*—1st, G. W. Nahrgang ; 2nd, M. T. Burn.
Special for best Fantail, C. Massie.

RED OR YELLOW MAGPIE.

Cock.—1st, G. W. Nahrgang ; 2nd, C. Massie. *Hen.*—1st. C. Massie ; 2nd, G. W. Nahrgang.

MAGPIE—A. O. C.

Cock.—1st, G.W. Nahrgang; 2nd, G.W. Nahrgang. *Hen.*—1st, G. W. Nahrgang ; 2nd, G. W. Nahrgang.

SHOW HOMER.

Cock.—1st, N. D. McPhie ; 2nd, H. B. Donovan. *Hen.*—1st, H. B. Donovan ; 2nd, H. B. Donovan.

SWALLOW.

Cock.—1st, C. Massie ; 2nd, M. T. Burn. *Hen.*—1st, C. Massie ; 2nd, N. D. McPhie.

DRAGOON.

Cock.—1st, G. J. White ; 2nd, G. W. Nahrgang. *Hen.*—1st, G. J. White ; 2nd, G. J. White.

ARCHANGEL.

Cock..—1st W. G. Nahrgang ; 2nd, G. J. White. *Hen.*—1st, G. W. Nahrgang ; 2nd, G. J. White.

NUN.

Cock.—1st, H. B. Donovan ; 2nd, N. D. McPhie. *Hen.*—1st, H. B. Donovan ; 2nd, N. D. McPhie.

OWL.

Cock.—1st, H. B. Donovan ; 2nd, H. B. Donovan. *Hen*,—1st, H. B. Donovan ; 2nd, H. B. Donovan.

TURBIT—BLACK.

Cock.—1st, H. B. Donovan ; 2nd, J. H. Baulch. *Hen.*—1st, J. H. Baulch ; 2nd, G. W. Nahrgang.

A. O. C. TURBIT.

Cock.—1st, H. B. Donovan ; 2nd, H. B. Donovan. *Hen.*—1st, H. B. Donovan : 2nd, H. B. Donovan.

A. O. S. VARIETY.

Cock.—1st, M. T. Burn ; 2nd, H. B. Donovan. *Hen.*—1st, H. B. Donovan ; 2nd, M. T. Burn.

RABBIT—S. C. LOP EARED.

Buck.—1st, Wm. Fox ; 2nd, Wm. Fox. *Doe.*—1st, Wm. Fox ; 2nd, Wm. Fox.

RABBIT—A. O. V, LOP EARED.

Buck.—1st, Wm. Fox ; 2nd, Wm. Fox. *Doe.*—1st, Wm. Fox ; 2nd, Wm. Fox.

RABBIT—DUTCH.

Buck.—1st, Wm. Fox ; 2nd, Wm. Fox. *Doe.*—1st, Wm. Fox ; 2nd, Wm. Fox.

RABBIT—A. O. V.

Buck.—1st, Wm. Fox ; 2nd, Wm. Fox. *Doe.*—1st, Wm. Fox ; 2nd, Wm. Fox.
Special for best rabbit, W. Fox.

HARES—BELGIAN.

Buck,—1st, Wm. Fox ; 2nd, Wm. Fox. Special for best imp. buck and doe, Wm. Fox.
Doe.—1st, Wm. Fox ; 2nd, Wm. Fox. Special for best domestic buck and doe, Wm. Fox.

A. O. V. CANARY.

Cock.—1st, A. W. Tyson ; 2nd, H. Sallows. Special for best pair, A. W. Tyson.
Hen.—1st. A. W. Tyson ; 2nd, H. Sallows. Special for best pair Germans, T. Sunley.

POULTRY ASSOCIATION OF EASTERN ONTARIO.

OFFICERS 1902.

President ..... F. H. GISBORNE ..... Ottawa.
1st Vice-President ..... G. S. OLDRIEVE ..... Kingston.
2nd Vice-President ..... C. J. DEVLIN ..... Ottawa.
Secretary-Treasurer ..... A. P. WESTERVELT ..... Toronto.

Directors :

W. H. CRAIG ..... Cornwall.
F. J. BLAKE ..... Almonte.
F. H. HENEY ..... Ottawa.
L. A. SMITH ..... Ottawa.
J. H. MAGILL ..... Port Hope.
C. J. DANIELS ..... Toronto.
F. C. HARE ..... Ottawa.

Delegates to Fair Boards :

Toronto Industrial ..... C. J. DANIELS ..... Toronto.
F. H. HENEY ..... Ottawa.

Ottawa ..... F. H. GISBORNE ..... Ottawa.
C. J. DEVLIN ..... Ottawa.

FINANCIAL STATEMENT.

RECEIPTS.

Cash on hand from previous year, as per last report	$403 45
Members' Fees	57 00
Legislative grant	500 00
Gate receipts	34 70
Entry fees, $211.00; scoring fees, $1.30	212 30
Interest on deposits	22 25
Total	$1,229 70

EXPENDITURE.

Balance due Treasurer, as per last report	55 29
Cash paid for prizes	593 36
Officers' salaries	82 25
Judges' expenses	75 00
Printing and advertising	39 85
O'Toole & Noel's balance due from last show	11 50
Freight on coops, $31.89; feed, $12.55; doorkeeper, $6.00	50 44
Superintendent, $16.00; assistant superintendent, $13.00	29 00
Cartage on coops, $3.25; wages for laborers, $21.50	24 75
Cleaning hall and replacing seats, $6 00; stationery, $7.21	13 21
Sundries, $8.93; carrying coops, $10.00	18 93
Board of Superintendent	4 50
Total	$998 08
Balance	231 62

Examined and found correct, this 4th day of March, 1902.

GEO. L. BLATCH, C.A., Auditor.

FRANCIS H. GISBORNE, President.
A. P. WESTERVELT, Treasurer.

Name.	P. O. Address.	Varieties exhibited.
Alpaugh & Gow	Fergus	Barred Plymouth Rocks, B. (R. C'b.) Bantams.
Arthurs, James	London	Silver Wyandottes.
Blake, F. J	Almonte	Silver Wyandottes
Bliss, T. A. D	Ottawa	Barred Plymouth Rocks
Barber, Wm	Toronto	Game and Bantams.
Benjamin, E. H	Ottawa	Old English Game.
Blyth, A. C	Toronto	Light Brahmas.
Berner, G	Toronto	Buff Leghorns.
Pristol, J. R. K	Ottawa	White Wyandottes.
Bogue, G. & J	Strathroy	Partridge Cochin, Javas, Dorkings, Buff Plymouth Rocks, Wyandottes, Black Spanish, Minorcas, Leghorns, Game, Golden Polands, Houdans, Red Caps, Cayuga Ducks.
Beeson	Ottawa	Light Brahma, White Wyandottes, China Geese.
Bastien, Dr. J. H	Rigaud, Que	Brown Leghorns, Game, Hamburgs, Houdans, Black Red, Brown Red and Pyle Bantams.
Cumming, D.	Russell	Silver Grey Dorkings, Buff Plymouth Rocks, White Wyandottes, Black Spanish, Brown Leghorns, Duckwing & C., Indian Game, Bronze and White Turkeys, Geese, Ducks, farmers' breeds.
Craig, W. H.	Cornwall	White Plymouth Rocks.
Clarke, Charles	Aylmer, Que	Light Brahma, Barred P. Rocks, Golden and White Wyandottes, White Leghorns.
Cameron, John	Brantford	Light Brahma, Buff Cochin Bantams.
Dundas, James	Deer Park	Buff Wyandottes and Buff Leghorns.
Delcord, A.	Ottawa	Minorcas, Polands.
Durston, R	Toronto	Black Minorcas.
Devlin & Jaques	Ottawa	Barred Plymouth Rocks.
Daniels, C. J	Toronto	Black Javas, Barred and Buff P. Rocks, Wyandottes, W. Indian Game, Red Caps, Orpingtons, Buff Cochin Bantams.
Frith, E. R	Maxville	S. G. Dorkings, Barred Pl. Rocks, Black Minorcas, O. English Game, Black Red Bantams, farmers' breeds.
Fortier & Nantel	St. Jerome, Que	Brahma, Cochins, Game, Black Hamburgs, Polands, S. Seabright Bantams.
Fraser, A. A.	Sandringham	
Frith, S. W. D	Winchester	Orpingtons.
Frith & Son, E	Winchester	Andalusians, Embden Ducks, farmers' breeds.
Gisborne, F. H.	Ottawa	C. Indian Game, Doves.
Graham, A. W	St. Thomas	Buff and Golden Wyandottes.
Garland, W. F	Hintonburg (Hintonburg Poultry Yards)	
Graham, Wm	Ottawa	Brown Leghorns.
Grant, John	Rockland	Golden Wyandottes, Black Minorcas, White Leghorns.
Gromoll & Schroeder	Ottawa	G. Wyandottes. Orpingtons.
Hartnett, M.	(Hintonburg Poultry Yards)	Langshangs, Barred Rocks, Silver Wyandottes, Black Minorcas, G. Seabright Bantams.
Heney, F. A	Ottawa W	Plymouth Rocks, White and Buff Leghorns, Orpingtons.
Harmer, E	Westboro	Buff Orpingtons.
Hillman, James R	Angus	C. Indian Game.
Hickman, W. E	Ottawa	Whith Wyandottes, Old English Game.
Hammall, Wm	Toronto	Bantams and Pigeons.
Higman, Geo	Ottawa	Buff Wyandottes.
Hertel, C	Hanover	Light Brahma, Golden Wyandottes.
Higman, A	Ottawa	Black Cochin, White Wyandottes.
Harrington, John	Russell	Brown Leghorns.
Hodson, F. W	Ottawa	
James, F. A	"	Barred Plymouth Rocks.
Kingsmill, T. F	London	White Wyandottes.
Kerr, Wm. K	East Toronto	Orpingtons.
Latta Bros	London	Black and White Cochin.
LaRose, Chas	Cornwall	Light Brahma, Barred and White P. Rocks, Andalusians, Game and G. Seabright Bantam.

LIST OF MEMBERS—*Concluded.*

Name.	P. O. Address.	Varieties exhibited.
McCaffrey, E	Russell	Buff Cochin, Barred Plymouth Rocks, White Leghorns, S. S. Hamburg, Pekin Ducks, Belgian Hares.
McCurdy, R	London	
McKinstrey, R. E	Ottawa	
McGregor, P. F	Almonte	Golden Wyandottes.
McLoud, Wm	London	Barred P. Rocks.
McNeil, Wm	"	Hamburgs, Polands and Bantams, Duckwing Game.
McMichael & Fink	Woodstock	Partridge Cochin, C. Indian Game, Black Hamburgs.
McKellar, D	Ottawa	White Leghorns.
McPhie, N. D	Hamilton	Pigeons.
Magill, J. H	Port Hope	Golden Wyandottes and Ponter Pigeons.
Moore, E. C	Toronto	B. (R. C'b.) & Buff Cochins Bantams.
Mason, John	Ottawa	White Plymouth Rocks.
Mills, Thos	"	White Leghorns.
Mills & Carleton	"	White Leghorns.
Moodie, N. G	Chesterville	Barred P. Rocks, Black Minorcas, Pekin Ducks.
Marshall, A. G	Ottawa	Golden Polands, Houdans.
Murray, W. G	Strathroy	Partridge Cochin, Black Leghorns.
Mutchmor, A. P.	Ottawa	Silver Grey Dorkings and China Geese. Silver Wyandottes, Brown and Buff Leghorn, Brown Red and Pyle Game, G. or S. P. Hamburgs, Bantams, Pigeons.
Ness, R	Howick, Que.	Silver Grey Dorkings and China Geese.
Noel, J. O	Ottawa	Pigeons.
Osborne, W. M	Brockville	White Minorcas, Black Leghorns.
Oldrieve, G. S	Kingston	Barred Plymouth Rocks, Golden Wyandotte, Brown Leghorns, Game and Bantams.
Oke & Andrews	London	White Plymouth Rocks.
Parsons, J. H	Osaca	Buff Plymouth Rocks, Buff Leghorns, Indian Game.
Player, W. J	Galt	Brown Leghorns
Pritchard, J	N. Wakefield	Light Brahmas, Buff Cochins, Barred Rocks, Golden and Silver Wyandotte, C. Indian Game.
Reid, W. H	Kingston	Mottled Javas, S. G. Dorkings, Black Leghorns, Old English or Pitt Game, Hamburgs, Silver Polands, Houdans, Red Caps, Bantams, Ducks and Pigeons.
Richardson, John A	South March	Pea Fowl and Geese.
Speer, Geo. H	Cornwall Centre	Farmers' breeds.
Short, S	Ottawa	Barred P. Rocks, White Wyandottes.
Stewart & Son, Wm	Menie	Black Javas, Dorkings, Black Minorcas, Leghorns, Hamburgs, Polands, Houdans, Red Caps, Bantams, Ducks, farmers' light breeds.
Smith, L. A	Ottawa	White Wyandottes.
Saunders, J	London	Buff Wyandottes, Andalusians.
Sage, L	"	Dark Brahmas, Duckwing Game.
Stewart, C. A	"	Buff, Cochin.
Strong, Robt	Ottawa	Pigeons.
Turpin & Driver	Kingston	Black Javas, Golden Wyandottes, Buff Leghorns, C. Indian Game.
Thompson, A	Allan's Corner's, Que.	White P. Rocks, Game, Turkeys, Geese, Ducks, farmers' heavy breeds.
Thompson, J	Fergus	Light Brahma, S. Seabright Bantams, farmers' heavy breeds.
Tozer, H. R. K	London	Light Brahmas, Brown Leghorns, Black Hamburgs, Brown Red Bantams.
Warrington, J. H	Cornwall	Dorkings, White P. Rocks, White Wyandottes, Black Spanish, White and Brown Leghorns, Old English Game, Black Red Bantams.
Willis, H. H	Granby, Que	Barred P. Rocks, Black Minorcas.
White, Geo. J	Hamilton	Bantams and Pigeons.
White, Geo	Ottawa, West	
Yuill, Mrs. Jos	Carleton Place	

POULTRY ASSOCIATION OF EASTERN ONTARIO.

REPORT OF THE SECRETARY.

I have to congratulate the Association on the large increase in membership for this year; also on the large entry for our show. Although the show is held at a later date than usual, both the exhibits and the number of exhibitors have increased in numbers. As you are all aware, the present dates were chosen, in order that the Poultry Show might unite with the Live Stock Associations, and have a cattle exhibit and sale combined with the poultry show. The object aimed at is to reach a greater number of people, and also to reach those people who, while they are the largest producers of market poultry, would be more likely to attend a poultry exhibition combined with an exhibition of live stock.

The poultry industry of this Province, both fancy and commercial, is in the hands of the Poultry Associations. It is their business to develop it. How far our market for poultry is extended depends to a great extent, on the work of the Poultry Associations. For some years the Ontario Department of Agriculture has given aid to the Poultry Associations to assist in this work. They have done a good work by encouraging the raising of a better class of poultry, by means of the competition at exhibitions. Without the work done by the Poultry Associations in the past, the poultry industry would not be in the advanced stage it is to-day. This is no reason, however, why we should not make the most of our present opportunities continue on progressive lines, and develop the poultry industry to its greatest extent. We have great opportunities. There is no other line of agricultural products capable of such a large proportionate increase. Those engaged in the export of poultry state that only a small percentage of the amount they require can be procured. The Minister of Agriculture of Ontario, recognizing the importance of the work, increased the grant to the Poultry Association, and also gave to the Eastern Ontario Poultry Association considerable more territory to take under its charge. The grant is now $1,000. The responsibility of the Association is proportionately increased. Your special work will be to arouse more interest in the poultry industry, to encourage the raising of more poultry, the feeding of that poultry better, and the placing of it on the market in a better finished condition.

How shall we do this work? Our poultry show should not be an exhibition only, it should bring out exhibits of the very highest quality. This can only be done by encouraging strong competition. But the poultry show should be a grand "round-up" of poultry fanciers and poultry raisers, where practical subjects relating to the poultry industry are discussed from a commercial standpoint.

In addition to the work done at our show, I believe we should also work through the local poultry associations and through the Farmers' Institutes. The local associations should be induced to take up the educational work in their own districts. During the winter months, fortnightly meetings could be held by the local societies. There are good poultry men in every district, who are capable of giving good practical talks on poultry subjects. Occasionally it might be possible to arrange for outside help. Special attention should be given to having a local association organized in every district where no local organization now exists. This is the only way in which the entire Province can be reached and the poultry industry boomed. The Eastern and Western Associations would in this way have affiliated with them all the local poultry associations in Ontario, and they would make a strong organization, able to take the part of poultry fanciers, and able to obtain just and necessary concessions from corporations and other bodies, should the occasion arise. There should be concentrated efforts on the part of these two Associations.

Our future policy should be to co-operate with the Poultry Experiment Stations; to use our best endeavor to unite into one organization all the poultry raisers in our district; to create more interest in commercial poultry through the local poultry associations, and by inducing the local Farmers' Institutes to hold special poultry meetings in their district, promote the educational as well as the exhibition features of our Poultry Show.

ANNUAL MEETING.

The annual meeting of the above Association was held in the Russell House, Ottawa, on Wednesday, February 12th, at 8 p.m. Mr. Francis Gisborne, President, in the chair.

Moved by Wm. McNeil, seconded by F. H. Heney, that the minutes of the previous meeting be taken as read. Carried.

The prize list, as published, was adopted.

The Secretary's annual report was then presented by the Secretary, and the Financial Statement for the year 1901 read by the Treasurer. The reports were adopted.

Moved by C. J. Devlin, seconded by L. A. Smith, that the minute on the records of a meeting of the directors authorizing the spending of some two hundred and thirty ($230) for the buying of new coops be rescinded, and that a committee be appointed to wait on the Minister of Agriculture with a view of getting a grant for the purchase of the coops on the same lines as the grant was made to the Western Association. Carried.

Moved by F. W. Hodson, seconded by W. H. Craig, that the proposed Constitution and By-laws for the Eastern Ontario Poultry Association be read by the Secretary. Carried.

The Constitution and By-laws were read, clause by clause. See page 69.

Moved by Mr. Higman, seconded by F. W. Hodson, that the Constitution, as read by the Secretary be adopted. Carried.

The officers for 1902 were then elected.

Moved by F. W. Hodson, seconded by A. P. Mutchmor, that a committee, composed of the Executive of the Eastern and Western Poultry Associations meet in Toronto at an early date in order to go over the prize lists, and also to consider a system of cooping, the appointing of a superintendent, etc. Carried.

The meeting then adjourned.

LECTURES AND ADDRESSES.

During the progress of the show several meetings were held, where addresses were delivered upon topics of interest to poultrymen. A report of the addresses and discussions follows.

DOMINION FATTENING STATIONS.

By F. C. Harf, Chief of Poultry Division, Ottawa.

I have just returned from addressing a series of meetings in the Maritime Provinces. I found while there that the practical meetings I had the pleasure of attending were those where the attendance was not large. The discussions seemed to be freer, and the people seemed to come more in touch with each other, and as a result the meetings were more practical, and I think did more good. I see by the programme that I am down to talk on the results of the Dominion Fattening Stations. The Dominion Department of Agriculture last year started three (3) illustrative stations for the hatching, rearing and fattening of chickens—one at Whitby, Ontario, one at Bondville, Quebec, and one at Truro, Nova Scotia.

Previous to the establishment of these rearing stations the Department of Agriculture was operating fattening stations, simply buying the birds from the farmers and fattening them for the market, and exporting the finished product. In connection with the fattening of chickens I may say that this is the most important branch of the poultry business. You may have well bred chickens, but they will not bring good prices on the home or foreign market, unless they are well fed and sent to market in the very best condition, and we are finding to-day that the best buyers will not take chickens that are not properly fattened or dressed, and the fattening is certainly the farmer's business. The end that the Department of Agriculture had in view in the establishment of these fattening stations was simply this: To show the farmers how they should prepare their poultry for the market, in order to make the most money out of it. At each of our stations the work is carried on by a farmer and the farmers of the neighborhood can learn all about every detail of the work. We know that the price of well fed and well dressed Canadian poultry has rapidly advanced, and that there is a large and profitable market for this quality of chickens. Besides the demand in the large Canadian centres of population there is a rapidly growing number of firms who buy these chickens for export to Great Britain. We know that in Great Britain there is a large market for chickens, and the demand there is for a chicken weighing from three to five pounds dressed. There is now very little demand anywhere for the big heavy chicken. The only time there is a demand for this type of chicken is in the local markets at Christmas time or in the holiday season. The demand is for chickens, plump and meaty as to the breast, with white flesh, of fine grain, small boned, weighing from three to five pounds dressed, and without a spur, and with no feathers on the legs.

Coming to the question of breeds, I would say that the two best American breeds are the White Wyandotte and the Barred Plymouth Rock. These are the two best market birds of the American breeds. Then of course we have the English Buff Orpington, which is a comparatively newcomer. The Americans are using the Plymouth Rock and the White Wyandotte almost exclusively, and I would like just here to sound a little note of warning to the poultry raisers, that I think it would be a good thing for Canadian poultry raisers to take up the English bird. If we breed the English bird and fatten the English bird, what is suitable for the English market, rather than the American breeds, there will not be as much danger in the future of the Americans stepping into the English markets and taking our market away from us.

As I said before these Experimental Fattening Stations were started to show the farmers and poultry men how to put their birds in the best condition for the markets, and in the condition they will demand the highest prices. Our market in Great Britain is practically unlimited for chickens of good quality. For chickens of the right quality they will pay from fourteen to sixteen cents per pound in England, which means about the same as thirteen to fifteen cents in Montreal. In the local market they are to-day worth eleven cents per pound.

In fattening our chickens at the fattening stations we use the fattening crates. These crates are about six feet long and cost about from $1 to $2 each to make. There is no doubt but that the use of the fattening crate is the right way to fatten chickens. It costs from one to two cents per pound less to fatten chickens in crates than in the ordinary pen, and about four cents less per pound than when the chickens were at liberty. At our Smithville station 131 chickens gained 2 pounds 9 ounces each in four weeks, in the crates, and with these chickens the crammer was not used. By using the crates the chickens are confined, all their food goes to create flesh, and they do not run the flesh off as they would do were they in the ordinary pen or at liberty, and I am sure this is a cheap way for farmers to fatten chickens. To fatten about one hundred chickens you will require about eight crates, which will cost from $8 to $12 for the lot.

I would just here like to read you a few letters from people around Ottawa and in other places who have fattened their chickens in crates.

These letters I have received from poultry men who are fattening their chickens :

Mr. D. Muirhead, Renfrew, asked in his first letter, "Kindly let me know who to ship to, as we cannot sell to advantage in Renfrew?" I wrote him recommending two firms in Montreal and one in Toronto. He wrote a second time as follows: "I got replies from all the firms you recommended and shipped them to McDuff Lamb. He paid 11c for them. I paid express charges ($1.40) and fed them about eight bushels of oats and barley and over one hundred pounds of low grade flour at $1 per cwt. We had lots of skim milk and fed all the feed mixed with it. The net weight of the twenty-four birds was 158 pounds, but McDuff Lamb paid for only 156 pounds, saying they had shrunk one pound per box. I got two of the boxes you left at Renfrew. If I had thought I would have asked you what they were worth, and could remit the price to you. The boxes were too small to hold our chickens and we had hard work to pack them in. McDuff Lamb said in remitting to me that the birds were in very good condition and were very, very nice. I killed and dressed them exactly as you showed me how to do. One of the cases of birds weighed 77 pounds, and the other 81 pounds. I have been thinking of putting up and feeding two or three hundred next fall, as I have a splendid place to feed them in. Our stable is warm, light and roomy. I would be glad to hear from you again with any information you may be able to give in regard to feeding next fall."

S. King Bayley of Boston, Mass., says: "I find that my customers are very well pleased with the fatted chickens, and want some every week."

Mr. Robt. Furness, of Vernon River Bridge, P.E.I., writes: "I fatted two lots of poultry lately, and I have found out that fatted poultry will sell well even in Prince Edward Island; I got 9c for the first lot and 10c for the second lot, and the man I sold to told me he could sell any quantity of such fowl. I had four chickens that weighed thirty pounds. I see that at Amherst the four best weighed twenty-seven pounds. I have been thinking of going into poultry stronger."

Mr Wm. Sloan of Ventnor, Ont., writes: "Sold Macduff Lamb, Montreal, and C. F. McArthur, Kenmore, Ont. . . They were a fine lot after we got them killed and shaped The shaping of them made a great difference in their looks."

At Fredericton, N.B., fatted chickens were sold by Mr. Stewart for 10c per pound.

It might be well just here to say a word as to the crates. These fattening crates are usually about six feet long and contain about twelve chickens each. We find that in the fall, say September and part of October, that the chickens in the crates do better in the open air. It is most important that there be plenty of ventilation. One of the most important points about these crates is to have the bottom slats left one and three-eighths inches apart. By leaving them this far apart all droppings will go through easily. The back and top laths should be about one and one-half inches apart, and the front laths about two and one-half inches apart running up and down. Then the bird can put its head right through between these slats without any trouble and take its food from the trough which runs across the front of the crate. Any farmer can make these crates. They are simply frames, and you will find it will pay every time to fatten your chickens in them.

Now as regards the kind of feed. What we want to do is to use a food that will give us the white fine-grained flesh. We find that chickens fed on corn have yellow flesh, and I have found that pea meal makes a hard flesh. A mash we have found to give satisfaction is one composed of pure ground oats with the hulls removed, mixed with skim milk. At our Bondville station we have used the following mash with good results: Equal parts of ground oats without the hulls, corn meal and low grade flour, mixed with skim milk. No whole grain is fed to the birds. This mash is fed three times a day the first week and twice a day the second, third and fourth week. The birds are given grit in their troughs twice a week. This is a good remedy for sour stomachs. In warm weather the fowls should get water twice a day and once a day in cold weather.

Q.: How old should the birds be when put in the crate?

Mr. Hare: They should be three months old and should weigh about 3 pounds.

Q.: Did you ever try to fatten the Leghorns?

Mr. Hare: We find that in the Leghorns the spur develops much more quickly than in any of the other kinds.

Mr. Hodson: What about the Dorkings?

Mr. Hare: They are good, but only one in a dozen farmers can raise them. The trouble is that too many farmers get the large breed and as a result they do not do as well as the smaller breed, although they make good broilers.

The Government sent over a large quantity of dressed chickens to the English market last fall, and realized 7 pence a pound on every shipment. After paying the transportation and commission, they net us 13c per pound in Montreal. We are holding some in Montreal to send over in the spring when chickens will be scarce in England and seling at a price better than this. The Department has agents in England watching the market and its requirements, and giving the farmers here the benefit of what they note. The following letter was received from Mr. J. W. Welton, the agent of the Dominion Department of Agriculture in London, England, as to a different shape of packing box for chickens:

"I had quite a long talk with Messrs. Charles E. Brooke & Sons, and noted down some suggestions they made, which I thought might be of some service to your Department." After stating some of the advantages and sizes of the boxes, Mr. Welton says with regard to the new one-layer box: "This package sells much more quickly than others with the same grade of stuff in them. The young man in Messrs Brooke & Sons told me that they sold in one week 350 boxes of Swifts packed in the new boxes, and about twenty of the square boxes, as the new boxes can be opened and laid on the table without disturbing the contents and the buyer can see every bird." With the square boxes the birds have to be pulled up to see the bottom chickens. Nothing less than twelve chickens, that weigh twenty-six pounds, should be shipped and then graded up to sixty pounds. The boxes are made in different sizes, as follows, inside measurements:

Small—21 1-2 inches x 16 inches x 4 3-16 inches.

Medium—23 3-16 inches x 16 5-8 inches x 4 5-16 inches.

Medium large—24 13-16 inches x 17 5-16 inches x 4 5-8 inches.

Large—26 1-2 inches x 18 inches x 5 1-4 inches.

The small size is for dressed chickens, shaped, weighing from three to three and one-half pounds. The medium size is for dressed chickens, shaped, weighing from 3 1-2 to 4 pounds, and the large boxes are for dressed chickens, shaped, weighing from 4 to 4 3-4 pounds. The material used for the construction of these boxes is basswood, dovetailed.

To return, however, to the chickens; after they have been in the crates for four weeks they are starved for thirty-six hours and then killed by dislocation of the neck. The neck should be taken between the first and second fingers and the chicken killed by pulling the head about one and one-half inches away from the neck. This method of killing allows the blood to drain down into the neck, and is much preferable to cutting off the head. If an incision is made in the fowl it will not keep half as long as the fowl killed in this way and it will eat dry and is not half as juicy as it would be. The English dealers are very particular as to this method of killing and will not take a fowl with the head removed.

As soon as the fowls are plucked they are placed in the shaping board and a weight placed on them. This shaping board is a very simple affair, but birds shaped will bring a higher price than those that are not shaped. It gives them a plump, compact appearance. Six hours in the shaping board is necessary to shape them properly, but chickens should not be packed until twenty-four hours after killing. It takes twenty-four hours for all the animal heat to leave the body of the chicken. Mr. Sloan of Vertnor writes me that he sent two lots of chickens to the exporters, each lot identically the same as the other, except in one particular; the one lot was shaped and the other was not shaped, and he received 2c more per pound for the shaped lot than for the lot unshaped.

After coming from the shaping board the chickens are packed twelve in a box breast up, and the boxes are so manufactured that when the box is opened the backs of the chickens will be uppermost. The heads are placed in such a position that they point to the middle of the box, and are laid between each of the birds in the opposite row.

Q.: Can small quantities be sent to England ?

Mr. Hare: Not less than two hundred chickens.

Q.: Would it pay to hold chickens till spring ?

Mr. Hare: Yes, if you have cold storage. Prices in England average about 14c per pound from the first of October, and 18c per pound in the spring.

Q.: Have you ever tried to fatten ducks ?

Mr. Hare: I believe there is a great demand in some parts of England for ducks, but as yet we have never tried this. We have it, however, under contemplation.

Q.: What kind of grit do you use ?

Mr. Hare: Lake shore gravel or cinders.

Q.: What about charcoal ?

Mr. Hare: Charcoal is very good and is one of the best kinds of grit for curing a sour stomach.

Q.: How thin should the mash be made ?

Mr Hare: It should be made very soft, about 17 pounds of milk to one pound of meal I will guarantee that any farmer who puts his chickens up and fattens them according to instructions, will get a good price for them, and more than that, the Department will be very pleased to assist and give any information to farmers who are desirous of giving the business a trial. I thank you all for your kind attention and would say that if any information is needed at any time if you will address the Poultry Department, Department of Agriculture, we will be pleased to furnish same.

By W. R. Graham, O.A.C., Guelph.

I would like to say a few words about some experiments we have been making with rations for the fattening of chickens. Our object in carrying on these experiments was to find out if possible the best ration for fattening chickens, and also the best ration for creating white meat and yellow meat. We also wanted to get as many good rations as we could, so that in case one of these should fail or we should not be able to get some of them, we would have another to fall back on.

I have here five different rations, all of which we have given a fair trial. Some of them have a weakness, but we found them all fairly good.

Ration No. 1. The weakness of this ration lay in the fact that it had a tendency to produce yellow flesh, but I do not know of a ration from which you will get better results as to fattening.

Ration No. 2 is what we call the Buckwheat Ration, and we get better results from this ration than from any other we have fed, and it costs less per pound of gain than any ration we have. You will see that this ration differs from No. 1 in that we use a smaller amount of cornmeal and larger amount of buckwheat, and we find the birds do better on this ration, as they seem to find it palatable. This is one great point: If you do not have a palatable ration you will not fatten your birds.

Ration No. 3 was a rather mussy ration and was not used with very good results. We intend to try this ration again, using two parts of corn and one of oats and the rest buckwheat.

Ration No. 4 was a rather strong ration, and we found in every case where we added more corn to the ration we increased the cost of production according to the amount of gain.

Ration No. 5 was simply oat dust mixed with skim milk.

Q.: What is oat dust ?

Mr. Graham: Oat dust is a dust that is blown from the oats in rolling them, and is almost like an oat flour. The only trouble we have had about this oat dust is that where we used to get it at a very low price, it has now increased in price about $5 a cwt. This is occasioned by the millers having found a new market for it They now ship it in large quantities to England, where the miners are using it in their drinking water.

Rations.	No. of trials.	Weight when put in crates.	After two weeks' feeding.	Gain.	Grain consumed.	No. of pounds of grain to mak 1 lb. gain.	Milk consumed.	Cost of pound of gain.
GROUP I—								cts.
Cornmeal, 5 parts								
Shorts, 4 parts ..... Cost per	First trial..	43	55	12	35	2.916	35	3 5
Pearl oat dust, 1 part .... cwt., $1.10	Second " ..	48 5	59 5	11 .	39	3.54	39	4.263
Animal meal, 1 part	Third " ...	49 5	61	11.5	38	3.3	38	3.974
	Average....	47	58.5	11.5	37.38	3.252	37.33	3.912
GROUP II—								
Cornmeal, 2 parts	First trial*...	.....	.....	.....	.....	.....	.....	.....
Ground buckwheat, 2 parts Cost per	Second "	48.5	65	16.5	42	2.54	42	3.363
Pearl oat dust, 1 part .... cwt., $1.22	Third "	48	63	15	40.5	2.7	41	3 56
	Average....	48.25	64	15.75	41.25	2.62	41.5	3.461
GROUP III—								
Cornmeal, 4 parts	First trial....	45	53	8	35	4 375	35	5.797
Ground backwheat, 2 parts Cost per	Second "	47.5	63	15	41	2.66	41	3 63
Pearl oat dust, 2 parts..... cwt. $1.22½	Third "	50	62	12	40	3.3	40	4 416
	Average....	47.5	59.33	11.66	38.66	3.445	38.66	4 614
GROUP IV—								
Cornmeal, 2 parts..... Cost per	First trial....	48	53.5	5 5	34.5	6.27	35	8.34
Pearl oat dust, 1 part . ... cwt., $1.23	Second "	48	60	12	38	3 18	38	4.22
	Third "	48	58 5	10.5	37	2 52	37	4.686
	Average....	48	57.33	9.33	36.5	4.32	36.66	5.748
GROUP V—								
	First trial....	48	60	12	34	2 83	34	4 83
Pearl oat dust—cost per cwt., $1.50 ...	Second "	49	63	14	40	2.85	40	4 57
	Third "	47.5	60	12.5	40	3.2	40	5.12
	Average....	48.166	61	12.83	38	2 96	38	4.84

* This food was not used in the first trial.

The following prices were paid for grain: Corn meal, $1.10 per cwt.; ground buckwheat, $1.20 per cwt.; middlings or shorts 90c. per cwt; animal meal, $1.60 per cwt. There were 12 birds in each trial of each group. The last 10 days of the feeding the birds were fed from the cramming machine, one and one-half pounds of milk being used to one pound of grain.

Q.: Have you ever used a substitute for skim milk?

Mr. Graham: Yes, we have, as we cannot always get skim milk. We find that we can use a substitute of what we call on the farm "beef soup," and this is a very good substitute for skim milk. You can get a beef head weighing about 21 pounds for from ten to fifteen cents, and we buy these and boil them in a large kettle of water until the meat drops off the bones. By doing this you get all the substance of the beef into the water and we mix our mash with this. We have also had a lot of experiments in connection with the various kinds of roots, mangels, turnips, sugar beets and potatoes. We have tried to find out the best ration and then mix this ration with the different kinds of vegetables, and we find that he mangels and sugar beets give the best satisfaction.

Q.: How do you feed your roots?

Mr. Graham: We pot them. I found that when I fed the roots whole the chickens would eat the inside of the root and leave the largest part of it, and my overseer complained of the refuse around the poultry house, and we find they give just as much satisfaction fed in this way.

You will see that the cost of a pound of gain in these experiments varied from 4 1-5c to 7c, the average being 5c. The fowls were grade Plymouth Rocks.

The skim milk used must not be too old. It must be just at that stage which in a cheese factory would be called a "starter."

Q.: What kind of sugar beets were used ?

Mr. Graham : The Danish sugar beets ; you will find they are not at all like the ordinary sugar beets, as they are about three times the size.

Q.: Did you use skim milk in connection with this root ration ?

Mr. Graham ? Yes, if we could get it, but I find that a point of great importance is that the rations must be palatable. You may make your ration as fattening as you please, but if your chickens will not eat it you have failed.

Q.: Do you find they relish buckwheat ?

Mr. Graham : There is no ration as well liked by the birds as buckwheat. It is a well known fact that corn-fed chickens have a yellow flesh. I will not say there is any difference in the flavor, but the standard of perfection for a table fowl has come to be a bird plump in the breast, small in the bone, with white flesh. If I have an order for chickens for a banquet or club dinner I know they want birds with a white flesh, and I see that they get chickens that have been bred and fattened for white flesh, and I feed them for a few days previous to killing with as much liquid in their food as I dare. If they have given me time I can give them the right kind of chicken. Of course if they come to me in the morning and want their birds for that evening I can supply them, but I always have more or less fear that they are not the right kind of birds.

We recently carried out an experiment with regard to feeding the chickens in crates or otherwise. We took one lot of chickens and fed them in loose pens. A second lot we fed in the ordinary fattening crates, and the third lot in the ordinary fattening crates for two weeks and then in the crammer. These chickens were all fed exactly alike on a ration of corn, oats and buckwheat, and at the end of twenty-four days were killed and shipped to a large exporter. We labelled the birds and asked him to pass judgment on them. For the birds fed in the crammer we received 11c a pound, for the birds fed in the fattening crates, 10c a pound, and for the birds fed in the loose pen, 9c a pound. This experiment was duplicated three times with three sets of chickens with exactly the same results. Then I undertook to fool the exporter, and I fattened three sets of chickens same as before, and in shipping them simply put them in the boxes anyway, leaving them to be sorted by the receiver. They were sorted in the very identical way they had been fattened, the three sets of chickens were separated just as I had them separated when feeding. So you will see the advantage of feeding chickens either in a crate or with the crammer, to fatten them to the best advantage.

Q.: Would you recommend a crammer for the ordinary farmer ?

Mr. Graham : You can make a better chicken with the crammer, but you can make a good chicken by the use of the crate without the crammer.

Q.: Do you feed ground bone ?

Mr. Graham : Yes.

Q.: Is dry bone as good as green bone ?

Mr. Graham : There is not much in dry bone.

Mr. Hare : The only thing in bone that is of advantage to the chicken is the albumen, and by buying heads as Mr. Graham speaks of and boiling them in the water until you have all the good out of the bone, and then mixing your mash with this water, you get all the good there is in the bone. I have found dry bone almost entirely useless.

Mr. Graham : I may say here that the chickens that were fed in the loose pen gained eleven pounds, or nearly a pound each, in the twenty-four days and the cost of a pound of gain was 7 1-2c. The chickens that were fed by the crammer gained twenty-one and three-quarter pounds on the lot and the cost of a pound of gain was 4.88c. The chickens that were fed in the crates gained fifteen pounds, and the cost of a pound of gain was 6 1-4c.

The point in all our experimental work in connection with feeding chickens is how to get them in the best possible shape at the least possible cost, so as to

bring a high price for them and fatten them as soon as we can. We make our chief gain during the first two weeks, as the birds eat a little more the third week and a little more again the fourth week.

As to the best breed of bird to fatten, of course the Plymouth Rock and the Wyandotte are the standard breeds, but I am inclined to favor the Buff Orpington. I think they are one of the best chickens from a market standpoint, but if your chickens are not bred right you cannot expect to have success in fattening them. Early in the fall a farmer bought a load of chickens to the college to sell. I took a look at the chickens, and when I saw what they were, I did not want to fatten them, and refused to take them. The farmer pleaded that he had brought the chickens a long way and could not afford to cart them back again, and offered me the lot at 5c per pound. They were a scrub lot, but I took them, and I undertook to fatten those chickens. After I had fed them for some weeks they were exactly in the same condition as when I took them over, so I killed them all but two. Now I fed those two birds for eleven weeks or nearly twelve, and we put them on the crammer and took them off the crammer, and tried them every way, and about the time of the Guelph Show one of those chickens did weigh one-half pound more than it did when I bought it. This may be an exceptional case, but it goes to show that breeding counts. If you have not the right sort of bird you cannot make a success of fattening them.

By A. G. Gilbert, C. E. F., Ottawa.

The value of experimental work, carefully conducted for a number of years, as a means of arriving at correct conclusions, cannot be overestimated. It puts an end to conjecture, so often given in the place of fact. The man who gives you his opinion, as thus and so, and in so doing often talks through his hat, has no place now before an audience of farmers or practical poultry men, such as I now have the very great pleasure of addressing. Backed up by an experience gained in fifteen years of experimntal work, and years before that as an amateur poultry keeper, I can speak with no uncertainty as to the certain breeds best suited for the farmer. I see by the programme that I am down to talk of some features of experimental work in connection with my department at the Farm. Let me speak of this special feature—the best breeds suited for farmers. I have advocated strongly the Barred Plymouth Rocks and the White Wyandottes as breeds best suited for the farmers of this country, for the reason that both varieties furnish good winter layers and rapid flesh-forming chickens.

We have now a comparatively new comer in the Buff Orpington, a variety that is bound to take a front place on account of its merits. It has a white skin and white legs, and so far the pullets have shown themselves to be excellent winter layers, and the cockerels to be hardy quick growers, and rapid flesh makers. When they are in greater numbers through the country, and should future experimental work warrant the many deservedly good things said about them, they will doubtless be held at cheaper figures and be generally adopted by the farmers. However, it must be a breed of rare merit that would take the place of the Plymouth Rocks and Wyandottes. But trade exigencies know no sentiment. It is the breed or variety of a breed that embraces the greatest number of points most suitable to the greatest demand, that will become universaly adopted. There is one strong point, in favor of the Buff Orpington, and that is that the farmers or breeders who hold them have birds with light legs, and white skin, suitable for both English and home market. The two strings to the Buff Orpington bow are doubtless strong points in their favor.

The position at present seems to be something like this. A great number of farmers have been advised in the past to procure Barred Plymouth Rocks and White Wyandottes, and have done so. Should they do away with them and take to the newcomers? Not at all. Let those who have Plymouth Rocks or Wyandottes keep them, and perfect their strains so as to have the best winter egg producers, and the heaviest flesh weight makers in the shortest time.

If the farmer is about to begin poultry keeping he may make a choice of Buff Orpingtons if he can procure eggs or stock at a reasonable figure. Experience so far gained shows it is better for farmers intending to commence to buy stock rather than eggs. Stock can be bought comparatively cheap in the fall months from a reliable dealer. In the spring following the purchaser should hatch out all the chicks he can and by the end of the season he will have sold cockerels enough to, in a great measure, recoup him for his first outlay. He will also have a number of pullets, worth at least one dollar each, as prospective winter layers, and he will have a parent stock besides, and they will be good as breeders for another year anyway. This will apply in any case. In the event of a farmer wishing a number of eggs to fill an incubator he should purchase from as nearby a source as possible, and from a breeder with a large number of hens, so as to ensure the eggs being as fresh as possible. Some may say, "But we would like some proof of your statement that the Plymouth Rocks, Wyandottes and Buff Orpingtons are the good layers and rapid flesh formers as you say they are." I offer the following:

Eggs laid in six months by old hens, yearling hens, and pullets in 1899.

No.	Pullets.	Dec.	Jan.	Feb.	March.	April.	May.	Total 6 months.
8	White Leghorns	41	106	90	84	98	119	538
8	Black Minorcas	25	39	102	77	91	94	428
8	Langshans	4	35	42	55	62	100	298
8	Barred Plymouth Rocks	91	119	88	131	116	103	648
8	White " "	23	106	101	117	105	74	526
8	Brown Leghorns	18	81	77	104	87	114	481
48		202	486	500	568	559	604	2,919
	Hens, two years and over.							
13	White Leghorns	40	50	32	91	130	160	503
7	Black Minorcas	49	40	47	84	96	120	436
10	Barred Plymouth Rocks	54	63	58	169	114	91	489
9	Colored Dorkings	76	46	65	48	51	26	312
8	White Plymouth Rocks	15	18	45	77	80	89	324
47		234	217	247	409	471	486	2,064
	Hens, one year old.							
11	White Leghorns	83	38	83	106	131	115	556
11	Barred Plymouth Rocks	72	49	72	135	111	83	522
22		155	87	155	241	242	198	1,078

The Barred Plymouth Rock pullets laid as follows;

On four days in December the Barred Plymouth Rock pullets laid 5 eggs.
On two " January " " " 6 "
On twelve " " " " " 4 "
On eleven " " " " " 4 "
On five " " " " " 5 "

Orpingtons. Four hens in December laid two and three eggs every day. The cockerels gained slightly over one pound per month.

My experience in rearing a superior quality of poultry flesh has been a large one for years past, and I have never had any trouble in obtaining a weight development of one pound and over per month on Plymouth Rocks, Wyandottes and Light Brahmas. But there are some important points in connection with the proper fattening of thoroughbreds or any kind of poultry, that our farmers will find indispensable to success. Summarized the most important are:

First. The proper breeds.

Second. Breeding from one but large, robust birds.

Third. The proper caring for and feeding of the chickens from the time of hatching. It is well to bear in mind that chickens ill fed or neglected in the first

five weeks of their existence will neither make good layers or satisfactory market fowl.

Fourth. The penning up of the birds at three or four months of age for three or four weeks or less, seems to give the best results.

To prove my contention that birds of the larger breeds properly treated require little fattening, I may say that at the end of last October I purchased from a farmer near this city four Barred Plymouth Rock cockerels, which weighed 7.14, 7.14, 7.07 and 6.05 1-2 pounds, most satisfactory weights you will admit for six months old chickens brought up by a farmer. A White Plymouth Rock cockerel, hatched on April 18th, weighed on the 21st October, six months and three days after, 7 lbs. 4 oz. The same bird on November 22nd, one month and one day later, 8 lbs. 8 oz., and on the 16th December, 14 days later, 9 lbs. 4 1-2 oz. Three other White Plymouth Rocks hatched on the 25th April weighed on the 21st of October following, being five months and twenty-six days, 5 lbs. and 14 oz. 5 lbs. and 12 oz. and 5 lbs. and 12 oz. A Barred Plymouth Rock cockerel hatched on April 30th weighed on the 8th November following, being seven months and eight days, 8 lbs. and 6 oz., and the same bird on the 6th of December 9 lbs. 5 oz. Another Barred Plymouth Rock cockerel hatched on the same day weighed on the 31st October, six months after, 7 lbs. 5 and one-half ounce, and three other cockerels of the same breed hatched on the 24th of May weighed on the 31st of October, five months and seven days later, respectively 5 lbs. 13 1-2 oz., 5 lbs. 6 1-2 oz., 5 lbs. 3 oz., and so with the other breeds. Light Brahamas did equally well, and all this goes to show my contention that with proper care and treatment Barred Plymouth Rocks and all the birds I have mentioned will put on at least a flesh weight of one pound per month. Perhaps not that weight in the first month, but afterwards they have made up, so that at the end of four or five months the weight will average at least one pound per month.

Q.: Would you recommend the crating of chickens to fatten them ?

Mr. Gilbert : Certainly. Crate them at three months, and I would advise you to crate them before they begin to moult.

Question : Have you ever used anything as a substitute for skim milk ?

Mr. Gilbert : No, I never have, for I do not use skim milk.

Q : I mean after they were crated ?

Mr. Gilbert : After they are crated we feed a mash composed of ground oats two parts, ground barley two parts, and corn meal one part, mixed up to a thin slop.

Q.: But do you ever use anything as a substitute for skim milk in mixing this mash ?

Mr. Gilbert : No, I never have.

Q.: Do you ever feed buckwheat ?

Mr. Gilbert : One of my favorite rations is one composed of one part ground barley and one part buckwheat meal.

I would also like to say here to any farmers who are present to breed as many chickens as they possibly can, and not to be afraid of over production. The exporters cannot get enough chickens. The demand from the English and local markets is rapidly advancing. The local people cannot get enough of them at 12 and 13c per pound.

A demonstration in chicken plucking and packing was given by J. Holliday, Toronto branch Ruddin Company, Liverpool, England; also instruction and explanation by W. H. Graham and F. C. Hare.

POINTS OF PRACTICAL VALUE IN THOROUGHBRED FOWL.

By Francis H. Gisborne, Ottawa.

I am down to give you a talk this morning on some practical points in thoroughbred fowl. Among some people at the present time there is considerable prejudice against thoroughbred poultry. We must first understand what is meant by

"thoroughbred." It means as far as the practical poultry is concerned, such a care in breeding as will fix certain types, and will enable us to renew our stock with certain defined traits of shape and color. As far as color is concerned we can practically ignore it. What is required is a bird of better shape, and the farmers should keep well shaped birds. In practical poultry we have three classes of breeds to select from. First, the American class, which includes the Plymouth Rocks, Wyandottes and Javas. Second, the English class, in which are the Dorkings, and the third class is the Indian Games.

Q.: Where do you place the Orpingtons?

Mr. Gisborne: The Orpingtons are simply Buff Rocks with white legs, beak and skin, and they really belong to the American class. So that as far as the farmer is concerned he must breed his birds for either meat or eggs. We will not talk of eggs for the present, but just of the meat.

The American Plymouth Rock standard has made a great advance lately. A few days ago poultry fanciers were breeding the Plymouth Rock with the short back, but now they are using a bird with a medium length in the back, and we have not yet reached perfection in this respect. What is wanted is a bird with a long back.

But we must also breed to get width on the breast and length on the keel. The breadth of the breast is the most important thing to take into consideration when securing a cockerel for breeding, as that is the principal part of the bird. I have here a type of the Plymouth Rock which is the best type of the American breeds. You will notice the width of this bird on the breast; also the length of keel and the length of back. This bird is also fine in the bone.

Now in regard to the Dorking breed, which is par excellence the best marked bird of the English breed. They have a very fine bone, and they are the largest keeled bird known. In England they raise cockerels from this breed that will weigh from 15 to 16 pounds each. As to the Indian Game bird it has a very short keel but the largest width on the breast of any bird known except the fighting Indian Game bird, which is bred for fighting purposes by the natives of the Malay Archipelago. The Game fowl are short and plump and the chickens are vigorous and easily raised. I would not recommend a farmer to keep the Indian Game, for they are very poor layers, but for an early hatching bird the game fowl cannot be beaten. They are good setters and the mothers are good to their chicks. The greatest trouble with the Dorkings is that the chickens are hard to raise.

The farmer wants an all-round good bird and therefore taking everything else into consideration, I would recommend the farmer to breed the Plymouth Rock, for they are a very vigorous and strong bird, and good winter layers, which are important factors to be taken into consideration. Then, they can be obtained at a reasonable figure, in fact, much cheaper than the Orpingtons. They do not require to be fed heavily, but require a moderately warm house.

Mr. Young: Why do you slight the White Wyandottes? Should a farmer not improve the type of the Rocks by breeding to a longer-keeled bird?

Mr. Gisborne: The English market demands a bird with white flesh, and I think that the Barred Rocks produce the flesh that is as white and as attractive as is possible to get. But the point rests largely in the selection of the breeding bird, and I am of the opinion that by a little more care being exercised we could get a very white-skinned bird out of the Barred Rock type. One great fault of the White Wyandottes is that they cannot be fed corn owing to the fact that it makes both their flesh and plumage yellow, and at the prices prevailing for corn just now I do not think any farmer would care to purchase it for hen food. When I am preparing my birds for show I always feed buckwheat, for it makes the flesh of the bird white.

With regard to the crossing of breeds I would say if it is carried on intelligently it is a profitable way of grading up to a good quality of bird, but only with the first crosses. In England they are crossing the Dorking with the Indian Game and getting very good results, for this cross gives length of keel and width of breast.

For winter there is no breed that will equal the White Leghorns and Anda-

lusians for winter layers, but they are not a practical bird for the all-round farmer. For summer layers the Black Minorcas are the best, but they are of no use as winter layers; therefore, it is very important that we get an all-round good fowl, and I would strongly recommend every farmer to keep the Barred Plymouth Rock.

Q.: If a farmer has a lot of fowl of different kinds, say a lot of scrub chickens, he cannot very well weed them all out at once, and in this connection what would you advise?

Mr. Gisborne: No. I would not advise the weeding out of the flock all at once, as you could hardly make a clean sweep, but I am in a position to give you advice as to this, as some years ago I found myself in this position. I would advise farmers to do exactly what I did with my own stock. There had been an interval in which I had not been keeping poultry, and I wished to start keeping it again. I bought ten or eleven scrub hens, and I can assure you, gentlemen, they were scrub hens. I bought these eleven pullets and kept them over one winter, and they began to lay before I really knew it. Well, I bought a thoroughbred White Leghorn cockerel, and I changed this cockerel every year, for I think three years, and at the end of three years I only had one chicken out of about fifty which showed any color. They were a little coarse in the bone perhaps, but for practical purposes they were grade Leghorns of a very good type. And my experience can be that of any farmer who will follow out this course.

THE BEST SHAPED FOWL FROM A FEEDERS' STANDPOINT.

By W. R. Graham, O. A. C., Guelph.

This question of the best shaped fowl from a feeders' standpoint I consider to be one of the first importance. For three years I have had more or less experience in fattening chickens for the home and also for the export trade. The more chickens I fatten the more I am inclined to believe that a very great deal depends on the shape of the bird. You know, of course, that there are chickens that will not fatten, and you know if you get a lot of scrub chickens and undertake to fatten these chickens you will lose money, and the money is what we are after. As regards the best shaped fowl from a feeder's standpoint, I think it would be well to bear in mind what the market, both home and export, now demands. In the first place we require a bird with lots of breast, in fact, you can hardly get a bird with too much breast. Then you want a bird with a good long keel, and a bird that is not too long in the legs, and a bird that stands straight on his legs. The most desirable bird to-day is one weighing from four to five pounds, and the flesh must be light colored. Now, if we have a bird which meets these requirements in every particular, we know that he will meet the present demand for the home and foreign market. The demand on these markets is now for white flesh. I find that in supplying chickens for all sorts of banquets, for club dinners and things of this kind, they all favor a white meat chicken, and these are the kind we always supply. Of course if they should want a yellow-meated chicken, and put in their order early enough, we can supply them, at least we should do our best to do so.

In selecting birds for feeding, we should first look at the head of the bird. I think there is a great deal for feeders to notice in the shape of the head. If I do not like the shape of a chicken's head I would not undertake to feed that chicken. Occasionally you will come across a chicken with a fine shaped head and only a fairly well shaped body, but generally with a well shaped head, you will find a well shaped body. However, in choosing a chicken for fattening I should place head first, body second and feet third. Select chickens with well shaped heads, good shaped bodies and with legs not too long. Now, I would like to say a few words as to their standing straight on their feet. I have found from experience that if you get chickens that are good otherwise but are "knock-kneed" as we call it, that after you have had

the bird in the crate from two to ten days it will go down. This is an undesirable feature in chickens for fattening, but is quite a prominent feature in a good many breeds, and one that we must guard against. In picking out a bird for fattening we must get one that is a good broad fowl, not too long, and one with a good constitution. If the chicken has not got a strong constitution to start with, before you begin to fatten it you cannot expect it to give you satisfaction. You want a bird with a splendid constitution, so that it will stand feeding or forcing.

I have a chicken here, of a kind I would like to fatten. I like a chicken with a bright, active eye. You will notice lots of chickens that have more or less sluggish eyes, but I like them with what I would call "get-up-and-get" in their make-up. As regards the comb I do not think it makes a great deal of difference whether a bird has a rose comb or any other kind. Before we leave the head, I should like you to notice the width between this bird's eyes. I like to see a bird with a good space between the eyes. Find a bird with its eyes close together, and you will have a senseless bird, and one that is not desirable from any standpoint.

We will leave the head and come to the breast. We cannot get a bird that is too wide across here. We did have one bird last year that was so wide in the breast that his legs aparently were put on after he was otherwise finished, and I suppose you might say that this bird I speak of was too wide, but this was an exception. The bird I have before me is well developed in this respect: he is very wide here in the breast. The one weakness (if we can call it a weakness, or if they have a weakness) of the Barred Rock to-day is the fact that they are short in the breast, and a little bit long in the leg. In the average bird this is their one weakness from a feeder's standpoint. Now, again, we must have a bird long in the keel, as Mr. Gisborne told you this morning. One trouble is in getting a bird with a long keel, you are apt in a case of this kind to get them with a long back, and this is not desirable. It is width that we want. In order to secure the very long keel it is necessary that we should have a bird fairly well matured. I may say I have never found one yet with a very great length in back and keel when young.

Again, I like to have a bird wide between the thighs, with the width carried well back. When you have a bird with legs not too long, wide across the breast and between the thighs, with the width running well back, you will always find that this bird will stand true on his feet. Notice this bird: Of course no bird can stand true on a table, and no matter how quiet he may stand, it is never perfectly natural. But look at the birds when they are running or standing, or when they are posing. You must know chickens pose to a great extent. If you will notice them then you will see them to their best advantage. Now this is one of the finest shaped birds from a feeder's standpoint I have seen for some time. Note the width across the breast, with the width between the thighs running far back.

Mr. Daniels: Would you consider that an ideal breast?

Mr. Graham: No, it is not my ideal breast. It might be more full. But the trouble is that when you have a bird with the breast more full than this and very plump, you find the keel will come too far forward, and you have one of the hardest types of bird to put on the market. You have to get this type of bird excessively fat. You go to the jobbers who are handling chickens, and you will notice at once the amount of centre board and the amount of legs this type has. Cut off the legs and there is nothing but centre board left. I do not like a chicken too deep in the breast.

Mr. Daniels: Must they of necessity be long in the keel if they are very deep in the breast?

Mr. Graham: They will be long in the keel if they are deeper in the breast than this bird I have before me. An ideal bird, if its head were cut off and its tail off it would be a perfect oblong or almost a square. I recently went through the shops in Boston Market, and in all of Boston market I never saw a turkey in its natural condition, and I never saw a turkey there with a high breast bone. Every turkey you looked at appeared to be plump, but I found that in every case the turkeys were not in their natural condition. The dealers there place their hand on top

of the breast bone, and by pressing on it break the two small bones one on each of the wishbone, and break the breast down. You might do the same with chickens, but if you did this and then undertook to ship them in barrels or boxes, when your birds were unpacked they would be all black and blue across the breast. You cannot do that. It would have to be the man who is retailing them, and he will save the time if he can. The trade does not like the chickens with the high breast bones. The great objection found by the exporters, and the large local dealers, with our Plymouth Rocks is that they have too much centre board for the amount of meat on each side of it. I like a chicken that is wide across the breast, and carrying the width straight back to the tail. This bird is fairly good in this respect, and if he were a little fuller in the breast he would just about suit me either to raise chickens or to feed.

Q.: Would you consider the White Wyandotte a good bird from a feeder's standpoint?

Mr. Graham: The White Wyandotte is a very good bird, but not a market chicken. There is one thing about the Wyandotte that we do not see in any other chicken. He shows practically no thigh. His legs seem to come almost straight out of his body. But as I said he is a good bird, but not for the market. You will see any amount of chickens, that when they weigh no more than their fellows, stand two or three inches higher. I might branch out here and state that I have during the last few years changed my ideas regarding the care of poultry a great deal. I have become what you might call "a fresh air crank." I do not consider any day in the winter too cold to open the door of my poultry house at least for several hours, and in the summer I like to have my chickens run out in the open air. We try as far as possible to have all the chickens out every day in the summer and as late in the fall as possible. In the winter I open the door of the poultry house about nine in the morning, and unless an exceptionally cold day leave it open until two or three in the afternoon. The inside of my poultry house is always dry and the temperature always is at about several degrees of frost. I have no objection to placing a stove in my poultry house, and keeping it warm, and installing a system by which the air could be changed every five or ten minutes during the day, but the question is what is it going to cost to install such a system of ventilation? And I find that my hens are healthier and have done better this year than for several years.

Q.: Do you know what the difference in temperature is between where you are situated and Ottawa or vicinity?

Mr. Graham: No, I would not say as to that, and I am not giving this as a rule, I am simply telling my experience in the matter. I have found, as I say, that my hens have never been healthier. The temperature in the henhouse is such that we have to dump the water out of the pans at night or the result would be either the pans would burst or they would have to be thawed out. And the temperature in the henhouse by day is such that the water freezes in the pans.

Mr. Gisborne: I wish to say in this connection that there is so much difference between the temperature here in Ottawa and vicinity, and in the part of the country where Mr. Graham is situated, that we could not think of attempting anything of that kind here. The idea of opening the doors of our poultry houses here and leaving them open for anything like the time of which Mr. Graham speaks, or even leaving them open at all, is simply preposterous.

Mr. Young: I may say in this connection that I have worked right along the same lines as Mr. Graham, and in two years have only lost two weeks that my hens did not lay. Our henhouse is never very warm, and I leave the door open for at least one-half an hour every morning and often longer. When I go in in the morning to feed the hens, I open the door and leave it open at least until I am finished. I have a curtain of burlap hanging down before where the hens roost at night, and this I simply have tacked up at one corner to let the birds go in and out. The temperature, I am sure, always contains one or two degrees of frost, and we get the eggs, and that is what we are after.

Mrs. Yuill: If you keep your hens working you will keep them warm. Give them something to do, and if you have active hens you will have laying hens.

Mr. Graham: I am not, as I said before, giving this as a rule, I am only stating it as an experiment. As I say, I always keep my henhouse in this state, and a man who came to see the birds one day recently stated that he would have me up before the Humane Society for cruelty to my hens, but when he went home I noticed he did the same thing.

Question: If hens had been used to being taken care of and being kept comparatively warm, would it not result disasterously to them to be changed to the mode of treatment you mention?

Mr. Graham: Of course I do not say that this could be done all at once, but I educate my hens to it. I let my hens run in the fall in the open until it is what some people would call very cold. People pamper their hens too much. I use my birds in the way I tell you and I have never had any of them frozen. One large Minorca male bird froze the top of his spikes a little. On this particular morning it was 12 degrees below zero, but it made a bird of him. I got this bird about the time of the Fat Stock Show. He had been fitted for a show bird and pushed too hard, and when I got him he went right down and his comb went over. I went out to look at him one morning and I came to the conclusion that he was going to die, and I resolved to either make him or break him, so I took him and put him right in the cold coop with the rest of the birds. He froze, as I said, the top of his spikes, but there is not a more hearty or more vigorous bird in the lot now, nor a chicken with any more "get-up-and-get" in him. If I had pampered that rooster, he would have been in the furnace long before this.

Mr. Gisborne: Have you any record of the temperatures in your henhouse, or any definite egg record this year compared with other years or years when your henhouse was more warm than this year? I would like to know this, as, according to my old-fashioned ideas, we must keep the hens warm to have good egg production.

Mr. Graham: I cannot give you any record of the temperatures, but I can send you a record of our egg production for the last three years. The egg record this winter, as compared with that of other winters is equally as good. In the Minorca class it not quite equals that of previous winters. In the Rock class it is equally as good, and in the Orpington class it is better than all. Of course, as I say, I do not deny the fact that you would no doubt get a better egg production if you kept the henhouse warm, but as I believe in fresh air before anything else, I have fresh air. If you give your birds lots of fresh air you will keep them healthy. But I would not go so far as to say that you could not get more eggs by using artificial heat.

Question: You say if birds are educated to the cold in the fall by not being brought in early, and are left to run in the open until it becomes cold, they will be healthy. Are you sure this will apply in every case? I had several fine birds frozen last year because I forgot them one night late in the fall.

Mr. Gisborne: The experience of this lady will be interesting, and I might say favorable to my side of the question. Mr. Graham tells you that birds may be educated to the cold by this method, and this case proves conclusively that birds, even if left out in the fall, and allowed to grow used to the cold gradually, will succumb to it when the temperature goes too low. I have had some experience along this line myself. I had a very fine bird, of which I thought a lot, a bird that had won prizes at several shows, and I found on going to my poultry one morning this bird frozen stiff, after being out too late in the fall.

Mr. Graham: Of course, as I say, I would not give this as a rule, but such has been my experience.

Question: What do you feed as a mash?

Mr. Graham: A mash composed of equal parts of bran, shorts and gluten meal, and a mash of part clover meal at least once per week. I like to feed clover hay in this way. I like to go into the stable where the men have been throwing down the clover hay for the cattle, and gather up a good bag of the small stuff and throw it down on the floor of the poultry house. In fact the floor of my poultry house is almost always

covered with this, and when I throw down the whole grain they have to pick it from among this small stuff.

Question : Do you ever put cayenne pepper in your mash ?

Mr. Graham : No, decidedly not. I never feed any kind of stimulants or condition powder.

Question : Do you feed ground bone ? And how often ?

Mr. Graham ? We feed ground bone about twice per week. I would feed it in small quantities every day, but I cannot get it every day.

Question : Do you mix it with anything ?

Mr. Graham : If I only have a little I mix it with the mash.

Question : Do you feed roots, and how ?

Mr. Graham : I used to feed the roots whole, but we found that the chickens would pick the soft inside all out of the root and leave a large part of the root lying around, and my overseer complained of the refuse, so now we pot all the roots.

Mrs. Yuill : I have tried hanging my roots up and letting the birds pick at them, and I find that they eat all the root in this way, besides giving the birds exercise.

Mr. Graham : Well, I have found the objection to this plan is that when a bird has to jump or has any trouble in getting the root in this way that she will not eat it, so we find that to pot the roots is the best way for us.

THE REARING AND HATCHING OF CHICKENS BY NATURAL AND ARTIFICIAL MEANS.

By F. C. Hare, Ottawa.

There is one thing that has come prominently to my notice, and that is the care that must be taken as to the selection of our layers. I have seen two pens of Plymouth Rocks, both receiving the same treatment and the same food, and yet the one lot would lay and the other would not lay, because one pen was bred by winter laying pullets and the other was not. This winter laying is artificial, and has been induced by selection. In order to make a success of winter laying one should select the right kind of pullets. Select pullets bred by good winter layers, force them the first winter, and then after that you can select from your best winter layers in the first year, those to breed from the second year. We find that in a majority of cases the best breeding females in the spring are hens that have been forced in the winter. If you force your hens the first year, and then select from them your breeders for the second year, say a pen of ten or twelve, you will have strong vigorous birds, and a much larger percentage of fertile eggs.

In regard to the stand taken by Mr. Graham, re fresh air in the henhouse, I think that one of the first things is good ventilation, but I do not think that the scheme of which he speaks could be duplicated here. There is too much difference between the temperature where Mr. Graham is situated and that in Ottawa and vicinity. I do not think it advisable to open the henhouse doors here. I think our temperature rather severe for that sort of thing, and we find that by keeping our hens warm they lay better If we want them to lay well we must keep up their strength. If we let them get cold at nights they will lose the benefit of the food they have eaten during the day time.

Winter laying also depends largely on the feeding of the layers. During the winter months the majority of layers are not given sufficient food, and also not sufficient fat material. The egg is composed of ten per cent. lime or shell, 60 per cent. albumen or the white of the egg, and 30 per cent. yolk. The albumen of the egg is the same muscle food as we find in meats; hence this albumen can be most readily and cheaply obtained from raw cut bones, scraps from the butcher, beef heads, livers, etc. The scraps can be fed either raw or boiled, and if cooked the water in which they are boiled should be mixed with the mash. The yolk of the egg is

pure fat, coloring matter and water. The fat can be obtained most satisfactorily from oats and corn.

At our Bondville station we had pullets penned up in crates laying on a mixture of equal parts of ground oats, ground corn, and low grade flour, mixed with water and one-fifth its weight of cut-up raw mangels. The weight of the mangels was one-fifth the weight of the meal. The pullets had no exercise, securing in addition to this mash only small quantities of grit and shell materials; and yet they laid at the time of the year when eggs were forty to fifty cents a dozen in Montreal.

How are we to feed to secure the best results? In the morning a small handful of barley scattered in the litter on the poultry house floor. In the middle of the day give a light warm mash of equal parts of ground corn, ground oats and fine mouldings, mixed with skim-milk or water, but I prefer the skim-milk and cut roots. If table scraps can be added to the mash, so much the better. At night allow each chicken a large handful of whole oats or whole corn, scattered around. The fowls should have waste meat of some kind every day, or if this cannot be obtained from the butcher, one pound of dried blood should be added to every sixteen pounds of meal in the mash. Fresh water, grit and shell material should be always on hand. In fattening chickens it is known that it costs from three to four cents more a pound gain in live weight to fatten chickens in December than in October, under the same conditions as are found in the ordinary poultry-house. Hence we see the need of warmth-giving food in the winter. Hens, to lay eggs, require food at first that will supply their bodily needs, and leave a sufficient quantity of nutriment to be available for eggs. One man wrote me recently and gave his experience in feeding. He said that until this year he secured a large number of eggs in November and December; this year oats and corn have been high in price, and he has substituted wheat for these grains. He is also feeding his mashes cold this year instead of warm, as he did last year. Last year for the last meal at night he gave the chickens roasted corn on the cob, but this year he feeds the wheat instead. Now, you will notice at once how much more warmth-giving, and also how much more correctly balanced his food was last year than this year. In the first place, oats and corn contain a greater amount of pure fat than any of the other grains, so that that excessive fat can be placed at once in the yolk of the eggs. Wheat is deficient in fat. Again, a considerable amount of the hen's vital energy is expended in raising the temperature of the cold mash fed her to the temperature of her body. Last year the mash was warmed, and no energy was required to convert its temperature. The warm roasted corn at night was beneficial in keeping the hen warm during the night, and also in correcting any tendency to sourness in the crop. Boiled livers and raw mangels were given the layers both years, so that we find that the reason this year's hens are not laying is simply because they have not sufficient nutriment to supply their wants, and also to form eggs; so that in this case the hen will pick the food to supply her body requirements, and will not lay eggs.

In the chicken hatching and rearing experiments conducted by the Department of Agriculture the eggs for hatching were bought from farmers in the neighborhood of the stations. These were marked on the small end with a rubber stamp so as to identify them. In this way we knew whose eggs were hatching the best and were able to secure eggs for future hatches from the farmers whose eggs showed the largest percentage of chickens. Incubators were used to hatch these eggs. Although the men in charge had not had any previous experience with incubators they ran them very successfully. After the chickens were hatched they were left in the machine for thirty-six hours, and were then transferred to the brooder, which was previously heated to a temperature of 100 degrees. We placed the brooder on the grass in a pen twelve feet square, and allowed fifty chicks to each brooder. There is a covered run in front of the brooder to protect the chickens in wet weather. Their first food was stale bread crumbs, moistened with milk and fed on a board, together with the gravel on the floor of the brooder. After this a little millet seed was fed, and the millet seed was continued along with a mixture of cracked grains, three times a day for the first three weeks. After that all these grains were discontinued. The main

object in feeding these grains was to give the young chickens plenty of exercise while scratching for them in chaff. After the chicks are three weeks old they do not require this grain for scratching, but will take exercise themselves.

Chickens will grow and mature more rapidly on a mixture of ground grains than they will on whole grains. The chickens were commenced the second week on a mash of equal parts of ground oats, ground corn and low-grade flour mixed to a moist, not a thin condition, with thick sour skim-milk. Care must be taken to see that the milk is thick and sour. Milk midway between sweet and sour is very harmful, as it continues decomposing in the chicken's crop. At first this was fed twice a day, alternate with the millet seed. When the millet seed and cracked grain was discontinued a mash was given four times a day for a month, then three times a day afterwards. The mash had in it one pound of dried blood to sixteen pounds of meal. The dry blood was fed in the mashes until the seventh week, when it was discontinued. At some of the stations a mash of ground oats, with the outer hulls removed, mixed with skimmmilk, was fed, and the chickens grew as well on this mash as on a mash of oats, corn, low-grade flour and skim-milk.

When the chicks were three weeks old the brooders were placed in pens containing about 300 square feet. The outside of the pen was wire netting, kept in place by posts driven in the ground, and the pens were changed to a fresh place every second week. After the twelfth week the chickens were allowed their liberty, but were fed the mash just the same, and when they were sixteen weeks old they averaged 5.1 pounds each. The cockerels weighed from 6 to 6 1-2 pounds each, and the pullets about 4 pounds each. They were then placed in the fattening crates. Some of the cockerels were such fine birds that it seemed a pity to fatten them, so the best were sold to the farmers, and their places filled by some younger cockerels only twelve weeks old.

Now in securing eggs for a hatch it is well to see that your eggs are fresh. We always try to get eggs that are not more than three days old, and we always find that when our eggs are fresh we are able able to secure a good hatch. In hatching by natural means it is always advisable to set a hen on the earth. When you sit a hen on the earth her eggs are never so apt to become chilled or dried. We have all seen chickens with the inner substance of the egg about them from which they were not able to break away. By keeping the hens sitting on the ground you overcome this difficulty. Our nests are simply like a box without a bottom.

Q.: Would you do this in the months of March and April ?

Mr. Hare : Yes, certainly.

Q.: Would there not be a certain amount of frost in the ground, which the warmth of the hen would thaw and the ground become wet.

Mr. Hare : Not in a poultry house, where the floor was dry

Now, again, in setting a hen we always find it best to put her on the nest at night. When you put a hen on the nest at night, and shut her on she is not so apt to come off and stay off.

Then, again, when we are setting four or five hens in one poultry house we think it better for a couple of times, when the hen comes off the nest, to put them back and see that they go back on the same nests, as in this way one bad hen will not be apt to spoil two or three lots of eggs. We have always found it best to let the hens off the nest in the afternoon, as when they come off in the afternoon they will usually go back at nightfall, and when they come off in the morning they will often stay off all day.

When we think the chickens are coming out, or about the 18th day, we go round the nest and sprinkle the ground all around the nest with water. We find this to help the hatching, as the eggs absorb the moisture and will not dry up easily.

Q.: When using an incubator where do you take your temperature from ?

Mr. Hare : From the thermometer at the top of the eggs.

Q.: Do you use the Cyphers Incubator ?

Mr. Hare : Yes. With regard to the heat in the incubator, we usually keep it at 102 degrees the first day and have in some of our experiments run it up to 105

degrees for the rest of the time. Mr. Cyphers recommends 102.5 degrees all the way through.

Q.: Where is the best place to keep an incubator?

Mr. Hare: Well, if you have a good cellar, that is as good a place as you could get, or a good woodshed, where the machine will be protected from drafts, but what is better than either is an upstairs back room. In one place we kept our incubator in a back room over a woodshed, I should say a room about 8 x 20. This was during the month of April, but during the second time we run the incubator there we found it was beginning to get too hot in the day time, so we brought them down stairs and put them in the woodshed, and I would say that of these eggs a large percentage were fertile.

As a result of our experiments at Bondville Station I give you the following figures:

No. put in	92	60	18	18	12	12	22	12	21	12	15	24	85	24	42
Chicks hatched	56	46	9	14	10	10	18	9	14	8	12	21	16	22	37

REPORT ON EXHIBITS AT EASTERN ONTARIO POULTRY SHOW.

By Sharp Butterfield, London.

The Eastern Ontario Poultry Show this year far exceeded the expectations of its most sanguine workers—something like 1,600 entries in the poultry, pigeon and pet stock classes—last year there was about 900. From present appearances it may next year easily amount to 2,000. We will then have two shows any country should be proud of. My life-long experience has taught me that individual experience and experiments have been often very costly, and I am sure Canada, since I landed in 1870, could never have made the advancement she has made had it not been for the fostering care of our Government.

Light Brahmas. A real good class of birds. Amongst them I noticed several of the winners of first prizes at the Pan-American.

Dark Brahmas. Some real good birds, and what they lacked in quantity they made up in quality. I noticed several first prize winners at the Pan-American, winning the same honors at Ottawa.

Buff Cochins. Were a grand good class, and the class was well filled. Several birds in this class were Pan-American winners, and also several first prize winners at the late New York Show.

Partridge Cochins. Great in quality, but would be better for more size. Still, several of them were Pan-American winners.

White and Black Cochins. Both good creditable classes, and several winners amongst them had won at the Pan-American and also at Boston recently.

Langshans. Quite a good class, and amongst them were several winners of firsts at the Pan-American, and amongst them were those which won the prize for best collection of Langshans, so we see by this at Ottawa Show we had quite a lot of champion birds, from the Pan-American and from the Show held at Guelph.

Rocks. These classes were good in Barred, Buff and White, and several birds changed hands at good long prices.

Wyandottes. Very heavy classes, especially so in Whites, and visitors had an opportunity of seeing some of the winners at the Pan-American. The same can be said of the Buff Wyandottes and Golden Wyandottes, the largest and best collection I ever met either in the United States or Canada. Silver Wyandottes contained some of the best females that have been produced, and several good male birds.

Minorcas. Were well represented by some very high-class specimens, especially first cock, first cockerel, first pullet.

Leghorns. A grand class both in Buffs, Browns, Blacks and Whites. Many in these classes could win at the best American shows, notably New York and Boston.

Andalusians. Were well represented, and amongst them I noticed the winning birds at Boston.

Black Spanish. The winners of all first prizes and all specials at Boston, were quite prominent at the Eastern Ontario.

Games and Game Bantams. I noticed some of those that won firsts at New York. and firsts at Boston, had to take second place at Ottawa. This shows that all Canada's best birds were not at Boston and New York.

Ornamental Bantams. Here one could find the very choicest specimens ever produced.

Turkeys, Ducks and Geese were represented by some of the best in the Dominion.

The show as a whole was one to be proud of as a Canadian Poultry Show.

PRIZE LIST.

Brahmas—Light.

Cock.—1st, Fortier & Nantel; 2nd, John Thomson; 3rd, H. R. Tozer.
Hen.—1st, Alex. Blyth; 2nd, John Thomson; 3rd, Alex. Blyth.
Cockerel.—1st, Alex. Blyth; 2nd. Chas. La Rose; 3rd, Alex. Blyth.
Pullet.—1st, Alex. Blyth; 2nd, John Thomson; 3rd, H. R. Tozer.

Brahmas—Dark.

Cock.—1st, L. Sage; 2nd, Fortier & Nantel; 3rd, Fortier & Nantel.
Hen.—1st, L. Sage; 2nd, Fortier & Nantel; 3rd, Fortier & Nantel.
Cockerel.—1st, L. Sage; 2nd, Fortier & Nantel; 3rd, Fortier & Nantel.
Pullet.—1st, L. Sage; 2nd, Fortier & Nantel; 3rd,

Cochin—Buff.

Cock.—1st, C. A. Stewart; 2nd, C. A. Stewart.
Hen.—1st, C. A. Stewart; 2nd, C. A. Stewart.
Cockerel.—1st, C. A. Stewart; 2nd, C. A. Stewart; 3rd, C. A. Stewart.
Pullet.—1st, C. A. Stewart; 2nd, Fortier & Nantel; 3rd, C. A. Stewart.

Cochin—Partridge.

Cock.—1st, W. G. Murray; 2nd, McMichael & Tink.
Hen.—1st, W. G. Murray; 2nd, G. & J. Bogue; 3rd, McMichael & Tink.
Cockerel.—1st, Fortier & Nantel; 2nd, McMichael & Tink; 3rd, W. G. Murray.
Pullet.—1st, Fortier & Nantel; 2nd, W. G. Murray; 3rd, G. & J. Bogue.

Cochin—Black.

Cock.—1st, Latta Bros.; 2nd, Latta Bros.
Hen.—1st, Latta Bros.; 2nd, Latta Bros.; 3rd, A. Higman.
Cockerel.—1st, Latta Bros.; 2nd, Latta Bros.; 3rd, A. Higman.
Pullet.—1st, Latta Bros.; 2nd, Latta Bros.; 3rd, Latta Bros.

Cochin—White.

Cock.—1st, Latta Bros.; 2nd, Latta Bros.; 3rd, Fortier & Nantel.
Hen.—1st, Latta Bros.; 2nd, Fortier & Nantel; 3rd, Latta Bros.
Cockerel.—1st, Fortier & Nantel; 2nd, Latta Bros.; 3rd, Latta Bros.
Pullet.—1st, Fortier & Nantel; 2nd, Latta Bros.; 3rd, Latta Bros.

Langshan—A.O.C.

Cock.—1st, R. McCurdy; 2nd, R. McCurdy; 3rd, Turpin & Driver.
Hen.—1st, R. McCurdy; 2nd, R. McCurdy; 3rd, Turpin & Driver.
Cockerel.—1st, R. McCurdy; 2nd, R. McCurdy; 3rd, Turpin & Driver.
Pullet.—1st, R. McCurdy; 2nd, R. McCurdy; 3rd, Turpin & Driver.

Java—Black.

Cock.—1st, G. & J. Bogue; 2nd, Turpin & Driver; 3rd, C. J. Daniels.
Hen.—1st, Turpin & Driver; 2nd, C. J. Daniels; 3rd, G. & J. Bogue.
Cockerel.—1st, G. & J. Bogue; 2nd, C. J. Daniels; 3rd, C. J. Daniels.
Pullet.—1st, C. J. Daniels; 2nd, G. & J. Bogue; 3rd, C. J. Daniels.

Java—Mottled.

Cock.—1st, G. & J. Bogue.
Hen.—1st, G. & J. Bogue; 2nd, W. H. Reid.
Cockerel.—1st, G. & J. Bogue.
Pullet.—1st, W. H. Reid; 2nd, W. H. Reid; 3rd, G. & J. Bogue.

Dorking—Silver Grey.

Cock.—1st, W. H. Reid; 2nd, J. H. Warrington.
Hen.—1st, G. & J. Bogue; 2nd, Wm. Stewart & Son; 3rd, J. H. Warrington.
Cockerel.—1st, G. & J. Bogue; 2nd, J. H. Warrington; 3rd, Wm. Stewart & Son.
Pullet.—1st, G. & J. Bogue; 2nd, J. H. Warrington; 3rd, J. H. Warrington.

DORKING—COLORED.

Cock—G. & J. Bogue ; 2nd, Wm. Stewart & Son.
Hen.—1st, G. & J. Bogue ; 2nd, Wm. Stewart & Son ; 3rd, Wm. Stewart & Son.
Cockerel.—1st, G. & J. Bogue ; 2nd, Wm. Stewart & Son.
Pullet.—G. & J. Bogue ; 2od, Wm. Stewart & Son.

DORKING—WHITE.

Cock.—1st, G. & J. Bogue ; 2nd, J. H. Warrington.
Hen.—1st, J. H. Warrington ; 2nd, G. & J. Bogue ; 3rd, J. H. Warrington.
Cockerel.—1st, G. & J. Bogue ; 2od, J. H. Warriogtoo ; 3rd, J. H. Warrington.
Pullet.—1st, G. & J. Bogue ; 2nd, J. H. Warrington ; 3rd, J. H. Warrington.

PLYMOUTH ROCK—BARRED.

Cock.—1st, Wm. McLoud ; 2nd, Chas La Rose ; 3rd, Devlin & Jacques.
Hen.—1st, Wm. McLoud ; 2od, Devlin & Jacques ; 3rd, Devlin & Jacques.
Cockerel.—1st, Wm. McLoud ; 2nd, F. A. James ; 3rd, Alpaugh & Gow.
Pullet.—1st, Devlin & Jacques ; 2nd, H. H. Willis ; 3rd, Wm. McLoud.

PLYMOUTH ROCK—WHITE.

Cock.—1st, Oke & Andrews ; 2nd, W. H. Craig.
Hen.—1st, W. H. Craig ; 2nd, Chas. La Rose ; 3rd, W. H Craig.
Cockerel.—1st, W. H. Craig ; 2nd, John Mason ; 3rd, W. H. Craig.
Pullet.—1st, Oke & Andrews ; 2od, Chas. La Rose ; 3rd, W. H. Craig.

PLYMOUTH ROCK—BUFF.

Cock.—1st, J. H. Parsons ; 2nd, C. J. Daniels.
Hen.—1st, J. H. Parsons ; 2nd, J. H. Parsons ; 3rd, C. J. Daniels.
Cockerel.—1st, C. J. Daniels ; 2od, J. H. Parsons ; 3rd, C. J. Daniels.
Pullet.—1st, C. J. Daniels ; 2od, J. H. Parsons ; 3rd, G. & J. Bogue.

WYANDOTTE—GOLDEN.

Cock.—1st, J. H. Magill ; 2nd, G. S. Oldrieve ; 3rd, A. W. Graham.
Hen.—1st, J. H. Magill ; 2nd, J. H. Magill ; 3rd, C. J. Daniels.
Cockerel.—1st, G. S. Oldreive ; 2nd, J. H. Magill ; 3rd, J. H. Magill.
Pullet.—1st, A. W. Graham ; 2nd, P. F. McGregor ; 3rd, J. H. Magill.

WYANDOTTE—SILVER.

Cock.—1st, Jas, Arthur ; 2nd, Fred J. Blake ; 3rd, Gatineau Poultry Yards.
Hen.—1st, G. & J. Bogue ; 2nd, G. & J. Bogue ; 3rd, Jas. Arthurs.
Cockerel.—1st, G. & J. Bogue ; 2nd, Jas. Arthur ; 3rd, G. & J. Bogue.
Pullet—1st, Jas. Arthurs ; 2nd, G. & J. Bogue ; 2rd, Fred J. Blake.

WYANDOTTE—BUFF.

Cock.—1st, J. Saunders ; 2nd, C. J. Daniels ; 3rd, Geo. Higman.
Hen.—1st, J. Saunders ; 2nd, J. Saunders ; 3rd, Geo. Higman.
Cockerel—1st, A. W. Graham ; 2nd, G. & J. Bogue ; 3rd, A. W. Graham.
Pullet.—1st, A. W. Graham ; 2nd, J. Saunders ; 3rd, A. W. Graham.

WYANDOTTE—WHITE.

Cock.—1st, T. F Kingsmill ; 2nd, T. F. Kingsmill ; 3rd, Geo. C. Beeson.
Hen.—1st, T. F. Kingsmill ; 2nd, J. H. Warrington ; 3rd, Geo. C. Beeson.
Cockerel.—1st, T. F. Kingsmill ; 2nd, T. F. Kingsmill ; 3rd, J. R. Bristol.
Pullet.—1st, T. F. Kingsmill ; 2nd, A. Higman ; 3rd, A. Higman.

SPANISH.

Cock.—1st, J. H. Warrington ; 2nd, J. H. Warrington
Hen.—1st, J. H. Warrington ; 2nd, J. H. Warrington ; 3rd, J. H. Warrington.
Cockerel.—1st, J. H. Warrington ; 2nd, J. H. Warrington ; 3rd, G & J. Bogue.
Pullet.—1st, G. & J. Bogue ; 2nd, J. H. Warrington ; 3rd, J. H. Warrington.

ANDALUSIAN.

Cock.—1st, J. Saunders ; 2nd, E. Frith & Son ; 3rd, E. Frith & Son.
Hen.—1st, J. Saunders ; 2nd, Chas. LaRose ; 3rd, E. Frith & Son.
Cockerel.—1st, Chas. LaRose ; 2od, E Frith & Son ; 3rd, E Frith & Son.
Pullet.—1st, Chas. LaRose ; 2nd E. Frith & Son ; 3rd, Chas. La Rose.

MINORCA—BLACK.

Cock.—1st, R. Durston ; 2nd, H. H. Willis ; 3rd. Hintonburg Poultry Yards.
Hen.—1st. E R. Frith ; 2nd, R. Durston ; 3rd, E. R. Frith.
Cockerel—1st, R. Durston ; 2nd, Hintonburg Poultry Yards ; 3rd, Wm. Stewart & Son.
Pullet.—1st, R. Durston ; 2od, Hintonburg Poultry Yards ; 3rd, Hintonburg Poultry Yards.

MINORCA—WHITE.

Hen.—1st, G. & J. Bogue. *Pullet.*—1st, G. & J. Bogue ; 2nd, W. M. Oshorne.

LEGHORNS—S. C. WHITE.

Cock.—1st, D. McKellar ; 2nd, John Grant.
Hen.—1st D. McKellar ; 2nd, J. H. Warrington ; 3rd, D. McKellar.
Cockerel.—1st, D. McKellar ; 2nd, D. McKellar ; 3rd, Thos. Mills.
Pullet.—1st, D. McKellar ; 2nd, D. McKellar ; 3rd, D. KcKellar.

LEGHORNS—S. C. BROWN.

Cock.—1st, Ottawa Poultry Yards ; 2nd, D. Cumming ; 3rd, Wm. Graham.
Hen.—1st, Wm. Graham ; 2nd, Ottawa Poultry Yards ; 3rd, Wm. Graham.
Cockerel.—1st, Dr. Bastien ; 2nd, Wm. Graham ; 3rd, Wm. Graham.
Pullet.—1st, Wm. Graham ; 2nd, Ottawa Poultry Yards ; 3rd, Wm. Graham.

LEGHORN—BLACK.

Cock.—1st, W. M. Osborne.
Hen—1st, W. G. Murray 2nd, W. M. Osborne ; 3rd, W. M. Osborne.
Cockerel.—1st, W. H. Reid ; 2nd, W. G. Murray ; 3rd, W. M. Osborne.
Pullet.—1st, W. G. Murray ; 2nd, W. G. Murray ; 3rd, W. M. Osborne.

LEGHORN—BUFF.

Cock.—G. & J. Bogue ; 2nd, Turpin & Driver ; 3rd, Turpin & Driver;
Hen.—1st, G. Berner ; 2nd, Turpin & Driver ; 3rd, G. & J. Bogue.
Cockerel.—1st, G. Berner ; 2nd, G. Berner ; 3rd, Turpin & Driver.
Pullet.—1st, Jas. Dundas ; 2nd, G & J. Bogue ; 3rd, G. Berner.

LEGHORN—R. C.—BROWN.

Cock.—1st, H. R. Tozer ; 2nd, H. R. Tozer ; 3rd, Stewart & Son.
Hen.—1st, H. R. Tozer ; 2nd, H. R. Tozer ; 3rd, G. S. Oldrieve.
Cockerel.—1st, G. & J. Bogue ; 2nd, R. H. Tozer ; 3rd, R. H. Tozer.
Pullet.—1st, G. & J. Bogue ; 2nd, R. H. Tozer ; 3rd, R. H. Tozer.

LEGHORN—R. C.

Cock.—1st, Stewart & Son ; 2nd, G. & J. Bogue ; 3rd, Alpaugh & Gow.
Hen—1st, Alpaugh & Gow ; 2nd, G. & J. Bogue ; 3rd, Stewart & Son.
Cockerel.—1st, Alpaugh & Gow ; 2nd, Stewart & Son
Pullet.—1st, Alpaugh & Gow ; 2nd, Alpaugh & Gow ; 3rd, W. H. Reid.

GAME—B. B. RED.

Cock.—1st, G. S. Oldrieve ; 2nd, Wm. Barber.
Hen.—1st, Wm. Barber ; 2nd, G. S. Oldrieve.
Cockerel.—1st, G. S. Oldrieve ; 2nd, Wm. Barber ; 3rd, Fortier & Nantel.
Pullet.—1st, G. S. Oldrieve ; 2nd, Fortier & Nantel ; 3rd, Wm. Barber.

GAME—BROWN RED.

Cock.—1st, Ottawa Poultry Yards ; 2nd, Wm. Barber ; 3rd, Dr. Bastien.
Hen.—1st, Wm. Barber ; 2nd, G. S. Oldrieve.
Cockerel.—1st, Wm. Barber ; 2nd, G. S. Oldrieve.
Pullet.—1st, Wm. Barber ; 2nd, G. S. Oldrieve ; 3rd, Dr. Bastien.

GAME—DUCKWING.

Cock.—1st, L. Sage ; 2nd, Wm. Barber ; 3rd, Dr. Bastien.
Hen. -1st, Wm. Barber ; 2nd, Dr. Bastien.
Cockerel.—1st, Wm. Barber ; 2nd, Wm. Barber ; 3rd, Dr. Bastien.
Pullet.—1st Wm. Barber ; 2nd, Wm. Barber ; 3rd, Dr. Bastien.

GAME—PYLE.

Cock.—1st, Ottawa Poultry Yards ; 2nd, G. S. Oldrieve ; 3rd, Wm. Barber.
Hen.—1st, Ottawa Poultry Yards ; 2nd, G. S. Oldrieve ; 3rd, Wm. Barber.
Cockerel.—1st, Wm. Barber. *Pullet.*—Wm. Barber.

GAME—COR. INDIAN GAME.

Cock.—1st, J. H. Parsons ; 2nd, J. H. Parsons ; 3rd, Jas. Hillman.
Hen.—1st, J. H. Parsons ; 2nd, D. Cumming ; 3rd, Jas Hillman.
Cockerel.—1st, J. H. Parsons ; 2nd, J H. Parsons ; 3rd, McMichael & Tink.
Pullet.—1st, Jas. Hillman ; 2nd, J. H. Parsons ; 3rd. J. H. Parsons.

GAME—A. O. S. V. OR W. INDIAN.

Cock.—1st, C. J. Daniels ; 2nd, Fortier & Nantel.
Hen.—1st, J. H. Parsons ; 2nd, C. J. Daniels ; 3rd, Fortier & Nantel.
Cockerel.—1st, Fortier & Nantel ; 2nd, C. J. Daniels.
Pullet.—1st, J. H. Parsons ; 2nd, Fortier & Nantel ; 3rd, G. & J. Bogue.

GAME—PIT OR OLD ENGLISH.

Cock.—1st, E. R. Frith ; 2nd, E. H. Benjamin ; 3rd, E. H. Benjamin.
Hen.—1st, E H. Benjamin ; 2nd, E R. Frith ; 3rd, E. H. Benjamin.
Cockerel —1st, E. H. Benjamin ; 2nd, J. H. Warrington ; 3rd, E. H. Benjamin.
Pullet.—1st, E. H. Benjamin ; 2nd, W. H. Reid ; 3rd, W. E. Hickman.

HAMBURG—BLACK.

Cock.—1st, Wm. McNeil ; 2nd, H. R. Tozer ; 3rd, Wm. McNeil.
Hen.—1st, Wm. McNeil ; 2nd, W. H. Reid ; 3rd, Fortier & Nantel.
Cockerel.—1st. Wm. McNeil ; 2nd, W. H. Reid ; 3rd, Wm. McNeil.
Pullet.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, W. H. Reid.

HAMBURG—PENCILLED.

Cock.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Dr. Bastien.
Hen.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Ottawa Poultry Yards.
Cockerel.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, W. H. Reid.
Pullet.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Dr. Bastien.

HAMBURG—GOLDEN SPANGLED.

Cock.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Stewart & Son.
Hen.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Stewart & Son.
Cockerel.—1st, Wm. McNeil ; 2nd. Wm. McNeil ; 3rd, W. H. Reid.
Pullet.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, W. H. Reid.

HAMBURGS—S. S.

Cock.—1st, Wm. McNeil ; 2nd, Wm. McNeil.
Hen.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Stewart & Son.
Cockerel.—1st, W. McNeil.
Pullet.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, E. McCaffrey.

POLAND—W. C. B.

Cock.—1st, Wm. McNeil ; 2nd, Stewart & Son ; 3rd, Fortier & Nantel.
Hen.—1st, Wm. McNeil ; 2nd, Fortier & Nantel ; 3rd, Wm. McNeil.
Cockerel.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Fortier & Nantel.
Pullet.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Fortier & Nantel.

POLAND—GOLDEN.

Cock.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Fortier & Nantel.
Hen.—1st, Wm. McNeil ; 2nd, Fortier & Nantel ; 3rd, Wm. McNeil.
Cockerel.—1st, Wm. McNeil ; 2nd, G. & J. Bogue ; 3rd, Fortier & Nantel.
Pullet.—1st, G. & J. Bogue ; 2nd, Wm. McNeil ; 3rd, Fortier & Nantel.

POLAND—SILVER.

Cock.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, W. H. Reid.
Hen.—1st, Wm. McNeil ; 2nd, Fortier & Nantel ; 3rd, Wm. McNeil.
Cockerel.—1st, Wm McNeil ; 2nd, Wm. McNeil ; 3rd, Stewart & Son.
Pullet.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Stewart & Son.

POLAND—A. O. S. V.

Cock.—1st, Wm. McNeil ; 2nd, Fortier & Nantel ; 3rd, Wm. McNeil.
Hen.—1st, Wm. McNeil ; 2nd, Fortier & Nantel ; 3rd, Fortier & Nantel.
Cockerel.—1st, Wm. McNeil ; 2nd, Fortier & Nantel ; 3rd, Wm. McNeil.
Pullet.—1st, Wm. McNeil ; 2nd, Fortier & Nantel ; 3rd, Wm. McNeil.

HOUDAN.

Cock —1st, G. & J. Bogue ; 2nd, A. G. Marshall ; 3rd, Dr. Bastien.
Hen.—1st, G. & J. Bogue ; 2nd, Stewart & Son ; 3rd, A. G. Marshall.
Cockerel.—1st, G. & J.Bogue ; 2nd, G. & J. Bogue ; 3rd, Dr. Bastien.
Pullet.—1st, G. & J. Bogue ; 2nd, Dr. Bastien ; 3rd, G. & J. Bogue.

RED CAP.

Cock.—1st, C. J. Daniels ; 2nd, G. & J. Bogue ; 3rd, W. H. Reid.
Hen.—1st, G. & J Bogue ; 2nd, C. J. Daniels ; 3rd, W, H. Reid.
Cockerel.—1st, C. J. Daniels ; 2nd, W. H. Reid ; 3rd. G. & J Bogue.
Pullet.—1st, C. & J. Bogue ; 2nd, C. J. Daniels ; 3rd, W. H. Reid.

ORPINGTON.

Cock.—1st, C. J. Daniels ; 2nd, W. Kerr, 3rd, Gromoll & Schroider.
Hen.—1st, C. J. Daniels ; 2nd, S. W. D. Frith ; 3rd, Gromoll & Schroider.
Cockerel.—1st, C. J. Daniels ; 2nd, W K. Kerr ; 3rd, Ed. Harmer.
Pullet.—1st, C. J. Daniels ; 2nd, S. W. D. Frith ; 3rd, S. W. D. Frith.

FOWL—A. O. S. V.

Cock.—1st, G. & J. Bogue ; 2nd, J. H. Warrington ; 3rd, Arthur Delcorde,
Hen.—1st, G. & J. Bogue ; 2nd, G. & J. Bogue ; 3rd, C. J. Daniels.
Cockerel.—1st. G. & J. Bogue ; 2nd, G. & J. Bogue ; 3rd, C. J. Daniels,
Pullet.—1st, G. & J. Bogue ; 2nd, G. & J. Bogue ; 3rd, J. H. Parsons.

GAME BANTAM—B. B. RED.

Cock.—1st, G. S. Oldrieve ; 2nd, Wm. Hammall ; 3rd, J. H. Warrington.
Hen.—1st, Ottawa Poultry Yards ; 2nd, G. S. Oldrieve ; 3rd, Dr. Bastien.
Cockerel.—1st. G. S. Oldrieve ; 2nd, J. H. Warrington ; 3rd, Wm. Hammall.
Pullet.—1st, G. S. Oldrieve ; 2nd, Ottawa Poultry Yards ; 3rd, G. S. Oldrieve.

BANTAMS—BROWN RED.

Cock.—1st, Ottawa Poultry Yards ; 2nd, Wm. Barber ; 3rd, G. S. Oldrieve.
Hen.—1st, Ottawa Poultry Yards ; 2nd, Ottawa Poultry Yards ; 3rd, Wm. Barber.
Cockerel.—1st, G. J. White ; 2nd, H. R. Tozer ; 3rd, Wm. Barber.
Pullet.—1st, H. R. Tozer ; 2nd, Wm. Barber ; 3rd, G. J. White.

BANTAMS—DUCKWINGS.

Cock.—1st, G. S. Oldrieve ; 2nd, Ottawa Poultry Yards, 3rd, W. H. Reid.
Hen.—1st, Ottawa Poultry Yards ; 2nd, G. S. Oldgrieve ; 3rd, Ottawa Poultry Yards.
Cockerel.—1st, Wm. Barber ; 2nd, Ottawa Poultry Yards ; 3rd, Wm. Barber.
Pullet.—1st, Wm. Barber ; 2nd, Wm. Barber ; 3rd, Ottawa Poultry Yards.

BANTAM—PYLE.

Cock.—1st, Wm. Hammall ; 2nd, Ottawa Poultry Yards ; 3rd, Wm. Barber.
Hen.—1st, Wm. Hammall ; 2nd, Ottawa Poultry Yards ; 3rd, Wm. Barber.
Cockerel.—1st, Wm. Hammall ; 2nd, G. S. Oldrieve ; 3rd, W. H. Reid.
Pullet.—1st, Wm. Barber ; 2nd, G. S. Oldrieve ; 3rd, Ottawa Poultry Yards.

BANTAMS—GOLDEN SEBRIGHT.

Cock.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Chas. LaRose.
Hen.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Chas. LaRose.
Cockerel.—Wm. McNeil ; 2nd, Wm. McNeil.
Pullet.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Chas. LaRose.

BANTAMS—SILVER SEBRIGHT.

Cock.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Fortier & Nantel.
Hen.—1st, Wm. McNeil ; 2nd, Fortier & Nantel ; 3rd, Wm. McNeil.
Cockerel.—1st. Wm. McNeil ; 2nd, Wm McNeil, 3rd, John Thomson.
Pullet.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Fortier & Nantel.

BANTAMS—BLACK ROSE COMB.

Cock.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Alpaugh & Gow.
Hen.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Alpaugh & Gow.
Cockerel.—1st, Wm. McNeil ; 2nd, E. C. Moore ; 3rd, Wm. McNeil.
Pullet.—1st, Wm. McNeil ; 2nd, E. C. Moore ; 3rd, W. H. Reid.

BANTAMS—BUFF COCHIN.

Cock.—1st, Wm. McNeil ; 2nd, C. J. Daniels ; 3rd, Alpaugh & Gow.
Hen.—1st, Wm. McNeil ; 2nd, C. J. Daniels ; 3rd, E. C. Moore.
Cockerel.—1st, Wm. McNeil.
Pullet.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, C. J. Daniels.

BANTAMS—BLACK OR WHITE COCHINS.

Cock.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Stewart & Son.
Hen.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, Ottawa Poultry Yards.
Cockerel.—1st, Wm. McNeil. *Pullet.*—1st, Wm. McNeil.

BANTAMS—JAPANESE.

Cock.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, W. H. Reid.
Hen.—1st, Wm. McNeil ; 2nd, W. H Reid ; 3rd, Wm. McNeil.
Cockerel.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, W. H. Reid.
Pullet.—1st, Wm. McNeil ; 2nd, Wm. McNeil ; 3rd, G. J. White.

BANTAMS—A. O. S. V.

Cock.—1st. Wm. Hammall ; 2nd, Wm. McNeil ; 3rd, W. H. Reid.
Hen.—1st, Wm. McNeil ; 2nd, Wm. Hammall ; 3rd, Wm. McNeil.
Cockerel.—1st, Wm. McNeil ; 2nd, Ottawa Poultry Yards ; 3rd, Geo. J. White.
Pullet.—1st, Wm. McNeil; 2nd, Wm McNeil : 3rd, Geo. J. White.

TOULOUSE GOOSE.

Cock.—1st, D. Cumming ; 2nd, A. Thompson : 3rd, J. A. Richardson.
Hen.—1st, D. Cumming ; 2nd, A. Thompson ; 3rd, J. A. Richardson.
Cockerel.—1st, A. Thompson. *Pullet.*—1st, D. Cumming ; 2nd, A. Thompson.

EMBDEN GEESE.

Cock.—1st, A. Thompson : 2nd, D. Cumming ; 3rd, A. Thompson. *Cockerel.*—1st, A. Thompson.
Hen.—1st, A. Thompson ; 2nd, A. Thompson ; 3rd, D. Cumming. *Pullet.*—1st, A. Thompson.

CHINA GEESE.

Cock.—1st, A. Thompson ; 2nd, D. Cumming ; 3rd, A. Thompson.
Hen.—1st, A. Thompson ; 2nd, A. Thompson ; 3rd, D. Cumming.
Cockerel.—1st, A. Thompson ; 2nd, R. Ness ; 3rd, A. Thompson.
Pullet.—1st, R. Ness ; 2nd, A. Thompson ; 3rd, A. Thompson.

A. O. V. GEESE.

Cock.—1st, A. Thompson. *Hen.*—1st, A. Thompson ; 2nd, A. Thompson.

ROUEN DUCK.

Cock.—1st, Stewart & Son. *Hen.*—1st, W. H. Reid ; 2nd, Stewart & Son.
Cockerel.—1st, Stewart & Son ; 2nd, D. Cumming ; 3rd, A. Thompson.
Pullet.—1st, D. Cumming ; 2nd, Stewart & Son ; 3rd, W. H. Reid.

PEKIN DUCK.

Cock.—1st, D. Cumming ; 2nd, A. Thompson ; 3rd, N. G. Moodie.
Hen.—1st, A. Thompson ; 2nd, D. Cumming.
Cockerel.—1st, E. McCaffrey ; 2nd, A. Thompson.
Pullet.—1st, A. Thompson ; 2nd, W. H. Reid ; 3rd, D. Cumming.

AYLESBURY DUCK.

Cock.—1st, W. H. Reid ; 2nd, A. Thompson ; 3rd, Stewart & Son.
Hen.—1st, W. H. Reid ; 2nd, A. Thompson : 3rd, Stewart & Son.
Cockerel.—1st, A. Thompson ; 2nd, Stewart & Son.
Pullet.—1st, A. Thompson ; 2nd, Stewart & Son ; 3rd Stewart & Son.

CAYUGA DUCK.

Cock.—1st, D. Cumming ; 2nd, W. H. Reid ; 3rd, G. & J. Bogue.
Hen.—1st, G. & J. Bogue ; 2nd, W. H. Reid ; 3rd, D. Cumming.
Cockerel.—1st, A. Thompson ; 2nd, G. & J. Bogue ; 3rd, D. Cumming.
Pullet.—1st, A. Thompson ; 2nd, G. & J. Bogue ; 3rd, D. Cumming.

A. O. V. DUCK.

Cock.—1st, A. Thompson ; 2nd, A. Thompson. *Cockerel.*—1st, A. Thompson ; 2nd, A. Thompson.
Hen.—1st, A. Thompson ; 2nd, A. Thompson. *Pullet.*—1st, A. Thompson ; 2nd, A. Thompson.

FARMERS' HEAVY BREEDS.

Cock.—1st, Chas. Clarke : 2nd, E. Frith & Son.

FARMERS' LIGHT BREED.

Cock.—1st, Stewart & Son ; 2nd, E. Frith & Son ; 3rd, D. Cumming.

WHITE EGGS, DOZEN.

1st, Jas. Dundas ; 2nd, E. R. Frith ; 3rd, E. R. Frith.

COLORED EGGS.

1st, Hintonburg Poultry Yards ; 2nd, E. R. Frith ; 3rd, A. Delcorde.

BRONZE TURKEY.

Cock.—1st, A. Thompson : 2nd, D. Cumming ; 3rd, A. Thompson.
Hen.—1st, A. Thompson ; 2nd, D. Cumming ; 3rd, A. Thompson.
Cockerel.—1st, A. Thompson ; 2nd, D. Cumming ; 3rd, D. Cumming.
Pullet.—1st, D. Cumming ; 2nd, A. Thompson ; 3rd, A. Thompson.

WHITE TURKEY.

Cock—1st, A. Thompson ; D. Cumming. *Cockerel.*—1st, A. Thompson ; 2nd, A. Thompson.
Hen.—1st, A. Thompson ; 2nd, D. Cumming. *Pullet.*—1st, A. Thompson ; 2nd, A. Thompson.

A. O. S. V. Turkey.

Cock—1st, A. Thompson. *Cockerel*—1st, A. Thompson ; 2nd, A. Thompson.
Hen—1st, A. Thompson. *Pullet*—1st, A. Thompson ; 2nd, A. Thompson.

Pair Plymouth Rocks, 1901.—D. Cumming. *Wyandottes, 1901.*—S. Short.
Pair Game.—1st, J. H. Parsons ; 2nd, Wm. Barber ; 3rd, Wm. Barber.
Best Pair.—J. H. Parsons. *Turkey, female, any age.*—D. Cumming.
Turkey, male, 1901.—A. Thompson. *Turkey, female, 1901* —1st, D. Cumming : 2nd, A. Thompson.
Goose, white, 1901.—D. Cumming. *Duck, pair, white, 1901.*—A. Thompson.

White Pouter.

Cock.—1st, Ottawa Pigeon Lofts; 2nd, Ottawa Pigeon Lofts ; 3rd, J. O. Noll.
Hen.—1st, Ottawa Pigeon Lofts.

Black or Blue Pouter.

Cock.—1st, J. H. Magill ; 2nd, J. H. Magill ; 3rd, W. H. Reid.
Hen.—1st, J. H. Magill ; 2nd, J. H. Magill : 3rd, W. H. Reid.

Pouter, A. O. C.

Cock.—1st, J. H. Magill ; 2nd, J. H. Magill ; 3rd, W. H. Reid.
Hen.—1st, J. H. Magill ; 2nd, J. H. Magill ; 3rd, W. H. Reid.

Carrier.

Cock —1st, Geo. White ; 2nd, W. H. Reid ; 3rd, Geo. J. White.
Hen.—1st, Geo. J. White ; 2nd, W. H. Reid ; 3rd, Geo. J. White.

Babe.

Cock.—1st, R. Strong ; 2nd, W. H. Reid ; 3rd, Geo. J. White.
Hen.—1st, R. Strong ; 2nd, W. H. Reid ; 3rd, Geo. J. White.

Jacobin—Red or Yellow.

Cock.—1st, Ottawa Pigeon Lofts ; 2nd, G. J. White ; 3rd, R. Strong.
Hen.—1st, Ottawa Pigeon Lofts ; 2nd, R. Strong.

White Jacobin.

Cock.—1st, Ottawa Pigeon Lofts ; 2nd, Ottawa Pigeon Lofts. *Hen.*—1st, Ottawa Pigeon Lofts.

Jacobin—A. O. C.

Cock.—G. J. White ; 2nd, J. O. Noll ; 3rd, Ottawa Pigeon Lofts.
Hen.—1st, G. J. White ; 2nd, Ottawa Pigeon Lofts.

Fantail—White.

Cock.—1st, Ottawa Pigeon Lofts ; 2nd, W. H. Reid ; 3rd, Wm. Hammall.
Hen.—1st, Ottawa Pigeon Lofts ; 2nd, Wm. Hammall ; 3rd, W. H. Reid.

Fantail—A. O. C.

Cock.—1st, W. H. Reid ; 2nd, R. Strong. *Hen.*—1st, R. Strong ; 2nd W. H. Reid.

Trumpeter.

Hen.—1st, W. H. Reid.

Tumbler—S. F.

Cock.—1st, W. H. Reid ; 2nd, N. D. McPhie. *Hen.*—1st, W. H. Reid.

Tumbler—L. D. C. L.

Cock.—1st, J. O. Noll ; 2nd, W. H. Reid ; 2rd, Ottawa Pigeon Lofts.
Hen.—1st, J. O. Noll ; 2nd, W. H. Reid ; 3rd, Ottawa Pigeon Lofts.

Tumbler—Muffed.

Cock.—1st, Wm. Hammall ; 2nd, Ottawa Pigeon Lofts ; 3rd, W. H. Reid.
Hen.—1st, W. H. Reid ; 2nd, Wm. Hammall.

Antwerp.

Cock.—1st, N. D. McPhie ; 2nd, N. D. McPhie ; 3rd, W. H. Reid.
Hen.—1st, W. H. Reid ; 2nd, N. D. McPhie ; 3rd, N. D. McPhie.

Turbit—Red or Yellow.

Cock.—1st, Ottawa Pigeon Lofts ; 2nd, Ottawa Pigeon Lofts. *Hen.*—1st, Ottawa Pigeon Lofts.

TURBIT—BLUE OR BLACK.

Cock.—1st, Ottawa Pigeon Lofts. *Hen.*—1st, R. Strong; 2nd, Ottawa Pigeon Lofts.

TURBIT—A. O. C.

Cock.—2nd, J. O. Noll.

OWLS—ENGLISH CHEQUERED.

Cock.—1st, J. O. Noll.

OWL—A. O. C.

Cock.—1st, W. H. Reid.

AFRICAN OWL.

Cock.—1st, Ottawa Pigeon Lofts; 2nd, Ottawa Pigeon Lofts; 3rd, G. J. White.
Hen.—1st, Ottawa Pigeon Lofts; 2nd, W. H. Reid; 3rd, G. J. White.

SWALLOW—RED OR YELLOW.

Cock.—1st, R. Strong; 2nd, N. D. McPhie: Ottawa Pigeon Lofts.
Hen.—1st, N. D. McPhie; 2nd, Ottawa Pigeon Lofts; 3rd, R. Strong.

SWALLOW—A. O. C.

Cock.—1st, Ottawa Pigeon Lofts; 2nd, J. O. Noll; 3rd, R. Strong.
Hen.—1st, Ottawa Pigeon Lofts; 2nd, J. O. Noll; 3rd, N. D. McPhie.

ARCHANGEL.

Cock.—1st, W. H. Reid; 2nd, G. J. White; 3rd, S. O. Noll.
Hen.—1st, W. H. Reid; 2nd, G. J. White; 3rd, J. O. Noll.

MAGPIE—BLACK.

Cock.—1st, Ottawa Pigeon Lofts; 2nd, Ottawa Pigeon Lofts; 3rd, G. J. White.
Hen.—1st, Ottawa Pigeon Lofts; 2nd, Ottawa Pigeon Lofts; 3rd, G. J. White.

MAGPIE—RED.

Cock.—1st, Ottawa Pigeon Lofts; 2nd, G. J. White.
Hen.—1st, Ottawa Pigeon Lofts; 2nd, Ottawa Pigeon Lofts; 3rd, G. J. White;

MAGPIE—A. O. C.

Cock.—1st, J. O. Noll.

NUN.

Cock.—1st, Ottawa Pigeon Lofts; 2nd, N. D. McPhie; 3rd, J. O. Noll.
Hen.—1st, Ottawa Pigeon Lofts; 2nd, Ottawa Pigeon Lofts; 3rd, N. D. McPhie.

SILVER DRAGOON.

Cock.—1st, G. J. White; 2nd, W. H. Reid. *Hen.*—1st, G. J. White; 2nd, W. H. Reid.

DRAGOON—A. O. C.

Cock.—1st, G. J. White; 2nd, G. J. White; 3rd, J. O. Noll.
Hen.—1st, G. J. White; 2nd, G. J. White.

SHOW HOMER—CHEQUERED.

Cock.—1st, N. D. McPhie; 2nd, N. D. McPhie; 3rd, W. H. Reid.
Hen.—1st, N. D. McPhie; 2nd, W. H. Reid; 3rd, N. D. McPhie.

FLYING HOMER.

Cock.—1st, W. H. Reid; 2nd, R. Strong. *Hen.*—1st, W. H. Reid; 2nd, R. Strong.

A. O. V.—PIGEON.

Cock.—1st, G. J. White; 2nd, Ottawa Pigeon Lofts; 3rd, R. Strong.
Hen.—1st, R. Strong; 2nd, G. J. White; 3rd, J. O. Noll.

PEA FOWL—PAIR.

Pair.—1st, J. A. Richardson.

DOVES—PAIR.

Pair.—1st, F. H. Gisborne.

BELGIAN HARE UNDER SIX MONTHS.

Buck.—1st, E McCaffrey.

CONSTITUTION AND BY-LAWS OF THE POULTRY ASSOCIATIONS OF EASTERN AND WESTERN ONTARIO.

CONSTITUTION.

1. This Association shall be called the Poultry Association of (Eastern or Western) Ontario.

2. The officers shall consist of a President, a First Vice-President, a Second Vice-President, a Secretary-Treasurer, and the Directors provided for by the Agriculture and Arts Act. The Ontario Agricultural College and Experimental Farm may annually nominate one of the staff of said institution as a director of this Association. The President of the Agricultural College is hereby requested to forward the name and address of said nominee to the Secretary of this Association, not later than December 5th of each and every year, and the members of this Association may at each annual meeting declare the aforesaid nominee duly elected.

3. By virtue of his office the Live Stock Commissioner of the Dominion of Canada shall be a member of the Directorate and the Executive of this Association, and shall enjoy all the powers and privileges of an annually-elected director or executive officer.

The Executive Committee shall consist of the President, the Vice-Presidents and the Secretary.

4. This Association shall hold a meeting or meetings each year on such date or dates as the Executive may decide.

5. Any person who has not been previously expelled may become a member of this Association by giving or sending his name and address to the Secretary, accompanied by one dollar. The membership fee is one dollar per year.

6. Each member shall be entitled to a free copy of each publication issued by the Association in the year in which he is a member, but shall not be entitled to previous publications.

7. The Association year shall be the calendar year.

8. Each member shall be annually supplied with a badge, which he shall wear when attending meetings of the Association. Only those wearing badges shall be entitled to vote.

BY-LAWS.

Annual Meetings.

9. At annual meeting each year the President, the First Vice-President, Second Vice-President and directors shall be elected, also one or more auditors, and delegates to represent this Association at such fair boards as the meeting by vote decides The report of the Executive officers shall be received, and such other business transacted as may be decided by the officers.

Duty of the Officers.

President.

10. It shall be the duty of the President to preside at all meetings of the Association, decide all questions of order, and make any suggestions he may deem necessary in the interest of the Association.

Vice-President.

11. It shall be the duty of the Vice-Presidents to aid and assist the President. In the absence of the President the powers and the duties of the President shall devolve on the Vice-Presidents in order of seniority.

Secretary-Treasurer.

12. It shall be the duty of the Secretary-Treasurer to attend all the meetings of the Association, the officers, the Executive and other committees, and keep correct minutes of same; conduct all correspondence and issue all press and other reports; also prepare for publication the Annual Report. As Treasurer he shall receive and account for all moneys belonging to the Association, pay all bills and accounts that have been approved of by the Executive. He shall have the power of Managing Director, acting under the control, and with the approval, of the Executive.

13. By virtue of his office he shall be a member of each committee appointed.

14. Before entering upon the duties of his office he shall enter into a bond, with security when required, which shall be approved of by the Executive Committee.

OFFICERS.

15. The President, Vice-Presidents, Secretary-Treasurer and Directors only, are officers.

16. The officers shall at the first meeting of the board and when afterwards necessary, appoint from among themselves or otherwise a Secretary-Treasurer, who shall remain in office during pleasure.

17. Officers shall make such suggestions as they may deem necessary for the benefit of the Association, look after the general interest of the same, and attend to such duties as the Executive may require.

18. At each Annual Meeting the retiring Executive officers shall present a full report of their proceedings, and of the proceedings of the Association, and a detailed statement of the receipts and expenditure for the previous year, and of assets and liabilities, a list of members, and the list of officers elected, and also such general information on matters of special interest to this Association as the officers may have been able to obtain, shall be sent to the Minister of Agriculture within forty days after the holding of such annual meeting.

19. It shall be the duty of each officer to support at all times the ruling of the majority, whether at the annual meeting, a meeting of the officers or an Executive meeting, his own opinion to the contrary notwithstanding.

20. No officer shall disclose motions, rulings, names of movers, seconders, etc., if at the meeting it is decided that such data shall not be made public, nor shall any officer furnish any newspaper with reports at variance with the official report.

21. The members of any committee shall have power to add to their number.

22. The person whose name is placed first on a committee shall be Chairman of that committee. It shall be his duty to call the committee together, and to do all in his power to conduct successfully the work for which the committee is appointed.

23. The actual and reasonable expenses of officers when attending board or Executive meetings shall be paid by this Association. The Secretary-Treasurer is hereby authorized to pay such accounts on receipt of a detailed statement of expenses, accompanied by a voucher for all sums of one dollar or over.

EXECUTIVE COMMITTEE.

24. The Executive Committee shall carry into effect the plan of work decided upon by the officers, and shall arrange the details of the same.

25. In case a vacancy occurs among the officers or in the directorate the Executive Committee shall fill such vacancy forthwith.

QUORUM.

26. (1) Not less than seven members shall be a quorum to transact business for the Association; not less than five officers shall be a quorum at an officers' meeting, and not less than three members shall be a quorum at an Executive meeting.

(2) Any member of the Directorate or Executive, not present at a meeting, if he send his views in writing, shall be considered as present.

(3) The officers or members of the Executive, or of any committee, may conduct by correspondence the duties assigned to said officers, Executive or committee, by the constitution or by-laws, or by the Association, when such a course is deemed advisable by said officers, Executive or committee.

Notice of Meetings.

27. At least two weeks notice shall be given of each annual or general meeting, naming time and place of meeting. Notice may be given through public press or by a circular letter mailed to each member.

28. An officers' meeting shall be called by mailing at least one week before date of meeting to each officer a notice of meeting as above provided.

29. Similar notice shall be given to each member of the Executive before an Executive meeting is held.

30. An officers' meeting or an Executive meeting may be held on shorter notice provided each officer or Executive officer (if an Executive meeting) is otherwise notified, and consents thereto.

Exhibitions.

31. Persons chosen to act as judges of the different breeds of poultry and pet stock at exhibitions controlled by this Association shall be those recognized by this Association as expert judges of the said breeds.

Misrepresentation.

32. The Board of Directors, on being made aware of any fraud having been committeed by a member or exhibitor in the entry of any stock or goods in competition for prizes, shall if they control the exhibition or department, withhold the payment of any pribes that may have been awarded by the judges to said member or exhibitor on such fraudulent or other entries made by any such exhibitor. The money thus withheld shall not remain in the hands of the Association, but prizes shall be awarded as though said exhibitor had not shown. Said exhibitor shall also be expelled from the Association for a term of four years or longer, and be excluded from exhibiting any stock or goods at exhibitions controlled by this Association for a similar period.

33. To facilitate a redistribution of awards in case any exhibitor should forfeit his prize or prizes, as provided in Section 32, there shall be added to each section of the prize list, in addition to the usual cash prizes, the reserve honorary numbers, "highly commended" and "commended."

34. If it is proved to the satisfaction of a majority of the officers and directors of this Association that a number has been guilty of the above-mentioned dishonorable practices at any other exhibition in Canada, or dealt unjustly with the public, said member shall be expelled from this Association.

35. A person convicted by this Association of a dishonorable act shall not be eligible for election of any office or position in the gift of this Association. If elected, the election shall be void.

Instructions to Delegates to Board Fairs.

36. The following instructions shall govern delegates representing this Association at fair boards :

(1) Every delegate appointed by this Association to attend fair boards shall make it his special duty to attend the important meetings of such fair boards.

(2) It shall be his duty to use every legitimate means within his power to advance the interests of this Association.

(3) It shall be his special duty to advocate and urge upon such fair boards the advisability of introducing and adopting such rules and principles as may be recommended by this Association, his personal opinion to the contrary notwithstanding.

(4) He shall use every reasonable means to have the amount of prizes increased, as the importance of the industry warrants.

(5) He shall report at the next succeeding meeting of this Association the result as to what he has been able to accomplish or otherwise.

(6) This Association shall defray the actual expenses of all such delegates when attending fair boards in its interests, but each delegate must send a written report to the Secretary, setting forth the work accomplished or undertaken by him in the interests of the Association. On receipt of such report and a detailed statement of expenses, accompanied by vouchers for all sums of one dollar and over, the Secretary-Treasurer is instructed to pay the expenses of such delegate.

Additions and Amendments.

37. Any additions or amendments to the Constitution or By-laws shall be presented in writing at a meeting previous to the adoption of the same, and shall require a two-thirds majority of the members present to pass.

Order of Business.

(1) Reading minutes of previous meeting.
(2) Address and report of officers.
(3) Reports of committees.
(4) Unfinished business.
(5) New business.
(6) Addresses and discussions.
(7) Opening of question drawer.
(8) Election of officers.
(9) Adjournment.

The above order of business may be replaced by another provided by the President or Executive.

Order of Meetings.

(1) Except by permission of the presiding officer, no member or other person shall speak, except to ask a question, or to introduce or to speak to a motion.

(2) In the discussion following the introduction of a subject no person shall speak more than twice, nor for a longer time than five minutes, except by a vote of the meeting.

(3) When a question is under consideration no motion shall be in order, except the following: (1) to adjourn: (2) to postpone; (3) to amend. These motions take precedence in the order named, and the first two shall be decided without debate.

(4) Before the vote is taken on any motion of amendment the President shall ask, "Is the meeting ready for the question?" The motion shall not be put so long as any member desires to speak and is in order. Any member desirous of asking a question on the subject introduced may do so verbally, but if he desires to ask more than two questions he must submit them to the Secretary in writing.

ANNUAL REPORTS

OF THE

DAIRYMEN'S ASSOCIATIONS

OF THE

PROVINCE OF ONTARIO,

1901.

DAIRYMEN'S ASSOCIATION OF EASTERN ONTARIO,
DAIRYMEN'S ASSOCIATION OF WESTERN ONTARIO,
THE DAIRY SCHOOLS OF ONTARIO.

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO.

TORONTO:
PRINTED AND PUBLISHED BY L. K. CAMERON,
Printer to the King's Most Excellent Majesty,
1902.

By Sections 5 and 6 of Chapter 17 of the Ontario Statutes for 1900, the names of the two Associations known as the Cheese and Butter Associations of Ontario were changed to, and will hereafter be known as, *The Dairymen's Association of Eastern Ontario* and *The Dairymen's Association of Western Ontario.*

WARWICK BRO'S & RUTTER, Printers and Bookbinders.
TORONTO.

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OFFICERS FOR 1902.

DAIRYMEN'S ASSOCIATION OF EASTERN ONTARIO.

President ..... D. Derbyshire, Brockville.
1st Vice-President ..... John McTavish, Vancamp.
2nd Vice-President ..... L. L. Gallagher, Wilton.
3rd Vice-President ..... John Echlin, Carleton Place.
Secretary ..... R. G. Murphy, Elgin.
Treasurer ..... P. R. Daly, Foxboro'.
Auditors ..... Morden Bird, Stirling. / F. W. Brenton, Belleville.

DIRECTORS:

Div. 1—Edward Kidd, North Gower.
" 2—Wm. Eager, Morrisburg.
" 3—J. R. Dargavel, Elgin.
Div. 4—James Whitton, Wellman's Corners.
" 5—T. B. Carlaw, Warkworth.
" 6—Henry Wade, Toronto.

INSTRUCTORS:

G. G. Publow ..... Perth.
L. A. Zufelt ..... Chesterville.
A. P. Purvis ..... Maxville.
John B. Lowery ..... Frankford.
J. H. Bensley ..... Warkworth.
Hugh Howey ..... Newburg.
R. W. Ward ..... Foxboro'.
A. B. Rabb ..... Brockville.

DAIRYMEN'S ASSOCIATION OF WESTERN ONTARIO.

Hon. President ..... Hon. Thos. Ballantyne, Stratford.
Hon. Vice-President ..... John Prain, Harriston.
President ..... Aaron Wenger, Ayton.
1st Vice-President ..... Jas. Connolly, Porter Hill.
2nd Vice-President ..... J. N. Paget, Canboro.
3rd Vice-President ..... Robt. Johnston, Bright.
Secretary-Treasurer ..... George Hately, Brantford.

DIRECTORS:

Div. 7—I. W. Steinhoff, Stratford.
" 8—Harold Eagle, Attercliffe Station.
" 9—Jno. H. Scott, Culloden.
" 10—Thos. Ballantyne, Jr., Stratford.
Div. 11—T. B. Millar, London.
" 12—Jno. Brodie, Mapleton.
" 13—A. F. MacLaren, Stratford.

Representatives to Industrial Fair, Toronto ..... A. F. MacLaren, M.P., J. N. Paget.

To Western Fair, London ..... T. B. Millar, Jno. R. Isaac.

DAIRYMEN'S ASSOCIATION OF EASTERN ONTARIO

ANNUAL MEETING.

The twenty-fifth annual meeting of the Dairymen's Association of Eastern Ontario was held at Whitby on the 8th, 9th and 10th of January, 1902. Every effort was made by the Mayor and citizens of the town to assist the members of the Association in making the convention a success, and the general opinion of those in a position to judge was that no better meeting of dairymen has ever been held in the Province. A marked feature of the sessions was the eagerness to ask questions shown by many in the audience, which proved that the topics selected for discussion were timely. The townsfolk crowded the Opera House on both evenings, and the happy combination of popular and practical addresses then given was warmly received. The presence of both the Dominion and Provincial Ministers of Agriculture also lent interest to the gathering.

PRESIDENT'S ADDRESS.

By D. Derbyshire, Brockville.

It is a great pleasure for our board to hold this our twenty-fifth annual convention in this enterprising town of Whitby, and I desire, on behalf of our dairymen to thank the Mayor and citizens for the cordial reception given us. I am sure you will be delighted to know that the Hon. Mr. Fisher, Minister of Agriculture for the Dominion, has kindly consented to open this convention, and identify himself with us in our great work of making a finer quality and a larger quantity of butter, cheese and bacon for the British market than ever before.

This is the first important dairymen's meeting ever held in this section, and we do hope we will be able to impress you more fully with the vast importance of our work. We made 2,194,686 boxes of cheese in 1901, valued at $17,500,000. We exported from Montreal up to the close of navigation 1,791,613 boxes; since the close of navigation, 102,439 boxes; from Portland, 200,634 boxes, and we have on hand 400,000 boxes, Prices for cheese have not been so high as last season, and we made more poor cheese last season than formerly. But our large, well-managed factories never made as many fancy goods as during the past season—good style, good boxes, good weights, everything correct—a joy to handle, so that we feel quite cheerful over the season's business in cheese. We can all rejoice over our creamery butter, for never in the history of our country have we made as fine quality. We made 670,893 packages, valued at $8,000,000, made us as follows: 410,893 packages exported from Montreal till close of navigation. Since the close of navigation, 35,000 packages have been shipped. We have on hand 25,000 packages, and we consumed 200,000 packages. So our cheese and butter came to $25,500,000, or a gain of $500,000 over 1900, and to this we must add our hog products, $14,500,000, which makes $40,000,000 that our dairymen have produced in 1901, and we are in better position to make more next season. Quite a number of our factories have been greatly improved, and we believe a large number more will be greatly improved before another season begins. A large number of our makers are attending one or other of our well equipped Dairy Schools this winter. Our dairy farms have more fertility, because of feeding everything out at home, and our people are becoming better all-round dairymen, so the future for our business looks bright. Hon. Mr. Fisher, our Dominion Minister of Agriculture, deserves great cre-

dit for the introduction of cold air into steamships carrying cheese this last season. Never in our history have we placed our cheese on the British market in such nice condition, and we do hope he will have this system greatly enlarged and improved. We still want from the Government refrigerator cars, with plenty of ice to carry our cheese to Montreal, the same as we have for butter. Thousands of fancy cheese are greatly injured in transit from the factory. We want this attended to this coming season. We ask the co-operation of sister dairy associations in getting quicker transportation in proper, clean cars, well iced, so that our product will be delivered in finest condition. It is ruinous to have our cheese hang around three or four days in some old, dirty, open car, and we must use every effort to remedy this. We are anxious to arouse our friends, so they will all go heartily to work to improve all along the line. With the advantages we have for education and instruction, it seems a pity to have an ordinary maker or poor factory. We should have the best facilities, because we must have all our cheese and butter finer in 1902. We must hold the leading position, and this can only be done by improvement.

I feel sure I can count on the hearty co-operation of every dairyman in Eastern Ontario to make one supreme effort during the coming season. I can assure you that the market never was in as good shape for using fancy goods as to-day, and I cannot remember when ordinary goods were as hard to place. We want every dairyman in our eastern section to promise that he will improve. Let that poor old cow, that never made a dollar, go. Improve your stables, build a silo, and have plenty of the best food for every day in the year. Improve your factories, and especially your curing-rooms. See that your maker attends the dairy school. In short, take hold earnestly to make the needed improvements so we can step right out of the way of any of our competitors. We can easily do this by uniting, for we can make the finest goods in the world, and it is our duty to do our very best, when so much depends upon our united action. With a little care we can also cheapen the cost of production. This is a matter which every dairyman should carefully study. We have had more trouble getting sixteen ounces for a pound this last season than ever before and our English friends receiving our goods have complained bitterly about weight. We might as well face this question now and make up our minds that if we want the best people for customers on the other side we must give them fancy quality, nice style and up weights, or they will look elsewhere for their supply. Let us understand this fully and apply the remedy by putting ourselves in such a position that we can turn out fancy goods every day. Do not hire a maker because he is cheap, but because he has the ability to do the best work. Do not try to get along another season with that old vat, press or curing-room, but put them right before you start the season. We have quite a large number of factories that have never made fine goods, never given weights, never had a cover for their waggon when delivering cheese; having trouble with every buyer, always thinking everybody dishonest except themselves, wanting the rules of our cheese boards changed often, instead of commencing right at home to put everything in the best shape for doing a good business. Put your factories and everything else around you in finest shape, educate your patrons how to care for their milk, and your trouble about selling cheese will soon disappear. We want better boxes, heading the best quality and properly seasoned. A large number of cheese have been greatly injured by using green heading.

We sent some butter and cheese to the Pan-American Exposition, and as on all former occasions, we carried off nearly all the prizes. Personally, I was not much in favor of sending any goods there, because we cannot sell them a pound of cheese, butter or pork. They fix their tariff to shut everybody out and I think our policy should be to shut them out; in other words, buy as much from them as they buy from us and not a penny more.

We made a change last season, having two instructors do nothing but instruct our makers, and I would like to add another instructor this year, if we can raise the funds. All our instructors have done their work very satisfactorily. Hon. Mr. Dryden, Minister of Agriculture, has aided us in every possible way. Prof. Robertson

has been as helpful as formerly. Mr. Ruddick, chief of the dairy division, has rendered good service. The secretary and treasurer have been careful and painstaking, and all have worked together for the upbuilding of our great national industry. The $40,000,000 we produced this last season could easily be made fifty this coming season by a little extra care on the part of everyone concerned, and then every industry in our country would flourish on account of the increased buying power of our people. We have made steady advancement and healthy lasting expansion in our dairy work, and we want this to continue. I have looked forward to this 25th annual convention to be held in your enterprising town with great pleasure. Your schools, churches and public buildings are very handsome; your merchants and manufacturers are up to date; the Ontario Ladies' College, that has been doing such splendid work is situated here. I am sure you are justly proud of all these; but our business here is to draw your attention to the greatest industry in this country. I mean the dairy business. By dairyman we mean a farmer who cultivates his farm the same as an ordinary grain farmer does, only better, and feeds all his crop at home and makes more money, besides enriching his farm so he can grow better crops each succeeding year. Once more let me urge all our friends to work together, having only one object in view, that of bettering the condition of our fellow workers and building up our great Dominion.

Henry Wade: I am delighted that at last we have succeeded in bringing the convention into district No. 6. As representative of this district on the board for twenty years I have attended all the gatherings of the Association, and I feel persuaded that this will be one of the most pleasant and profitable ones in the history of the body. Of course the district is not so much a dairy section as those further east are. We have been paying attention chiefly to live stock and grain raising, and other lines of farming. But of late dairying has been developing, and already some good creameries have been established. I was one of the pioneers in starting dairying in this section of Ontario—a little further east of here—and I have been pleased to see the extraordinary development made in both cheese and butter making since that time. I have been proud, also, of the fact that Canada won so many prizes at the Pan-American Exposition, and am sorry that we did not exhibit even more fully.

L. L. Gallagher: One of the reasons for the cheese not being so good this year was the fact that in many cases the rennet used was not of the best quality.

The President: That may be, but there were other reasons, and some of them could be easily controlled if patrons and makers would rise to the occasion. After all, we do not need legislation so much as we do to get the hearts and heads of the people right. More education, mental and moral, is required. Our Dairy Schools and our inspectors are helping wonderfully along these lines. Every cheese and butter maker, properly equipped, is an educator. However, the weighers and examiners also have their place in this educational plan, and I am hopeful that between their work and the work of this Association and other agencies, the proper change of heart will be brought about.

COMMITTEES.

The following committees were appointed:
Business—Mayor Ross, Fred. Hatch, R. G. Murphy.
Nominations—J. R. Dargavel, James Whitton, and Wm. Eager.
Legislation—Edward Kidd, M.P., R. G. Murphy, Wm. Eager, and H. Wade.

DEVELOPING A DAIRY HERD.

By Joseph E. Gould, Uxbridge.

When I was introduced to Farmers' Institute gatherings by Major Sheppard he always told me that if they ever got to Uxbridge and saw a man going about with an ear of southern corn protruding from one pocket and a copy of "Hoard's Dairyman" sticking out of the other, that they might be sure it was Joseph Gould. (Laughter.) Now a man should always stick to his best friends, and these two things mentioned by the Major have been my very best friends in the dairy business. And these two ought to make any man who has to handle cows successful. I have been into this thing for about eight years. I started as a dairyman with hardly any knowledge, and therefore I had few, if any, prejudices to overcome. I simply had to find out for myself the best things to do or to avoid..

At the very beginning I wish to impress upon dairymen the importance of having the best cow you can procure. It is very rare that you can pick up a good dairy cow by ordinary purchase, as a man who has a really good animal is not likely to let her go. The best plan is to get a good cow, and raise your own stock, culling as often as is necessary. I have 52 head of cattle, young and old, and 34 of them are now milking. There is only one cow in that lot that I have not raised myself during the last eight years. I have killed many, because they have not come up to my standard as milkers. That standard is 275 pounds of butter per annum, and any cow that does not come up to that mark is of no use to me. If a cow in her fourth year does not give 275 lbs. of butter then someone else has to feed her. (Applause.) I suppose that the average of the Province is not over half the amount required by my standard, and if that be so, then I am positive there can be no profit in it.

The next important point to be considered is the feeding and care of this selected cow. Proper feeding should be carefully studied by the dairyman. About 80 per cent. of the cows of this Province are not producing the amount of butter they should, and this not so much of their fault as through the bad management of their owners. There are some dairymen who do not appear to have enough brains to run a wheelbarrow. (Laughter.) If cows are not properly fed and housed, how can any man expect profit from them? In my own case, I keep my cows in the stable all the time. The temperature is never lower than 40 degrees or higher than 65 degrees. I keep my stables as light as this hall—no dark, dreary stables for my cattle—and I give them all the good food they will have.

The trouble with many dairymen is that they do not train their cows when they are young to be persistent milkers. Why should I keep a cow that will give milk only eight months of the year, and let her run dry and just board with me for four months? There is neither profit nor sense in that. The saying is true that "The nimble ninepence soon overtakes the slow shilling." I have cows that have milked every month in the year, and some that have been idle not more than four or six weeks. It is the persistent milker that pays.

My cows are given as much ensilage as they will eat, besides bran and oats. I feed bran the year round, and gave ensilage 351 out of the 365 days in last year. To be successful in dairying you must feed the year round. You say there is trouble in getting your cows to come home for feeding. There is no trouble whatever in the matter if you feed regularly and properly. My cows come home at the same time every night, of their own accord, because they know that the feed will be waiting for them when they come. It does not pay to keep cows walking up and down the field looking for pasture and tramping it down at the same time. I can supply feed at less cost in other ways. Ensilage is the basis of my feeding. I had 17 acres of corn, which gave me last season 225 tons of ensilage. Down at the front here, where you are freer from frost than we are, you can raise a larger variety of corn, and could produce as much on 14 acres as I have raised on 17. I have only 12 acres of pasture on the whole place.

I consider it much cheaper to grow corn for feeding than to have cows wandering about the pasture field.

Let me give you a few illustrations from my own herd. I have 31 cows. One of these gave 7,253 lbs. of milk last year. She is a Grade Durham, and her milk tests about 3.6. Another cow gave 7,271 lbs. of milk. A three-year-old gave 5,682 lbs. Another one, which is the most persistent milker I have, milking 12 months in the year, gave me 9,015 lbs. Another cow gave 1,252 lbs. of milk in May, 1,100 lbs. in June, 1,016 lbs. in July, and 1,031 lbs. in August. She gave a total of 8,359 lbs. for the year. A pure bred Jersey gave 8,484 lbs.

The total production of my herd of 31 milkers last year was 146,730 lbs. of milk, or upwards of 70 tons. The average test of the herd, as shown in the returns of the Cannington creamery, ranged from 4.1 to 4.42 of butter fat for the year. The amount of butter made was 6,968 lbs., and the cash returns from the butter sold amounted to $1,280. From this amount must be deducted $65 for freight on shipping the cream, but to this should be added $300, as the value of skim milk fed to hogs. That made my total returns from the herd $1,500. That return was secured from a farm of 110 acres. I could not have done the same ten years ago, because the farm has meantime been enriched by feeding everything on the place. I do not really have to buy anything for feeding my cattle, because I trade oats grown on the place for bran obtained at the mill, so that, as I say, the returns from my herd, worth $1,500, were all obtained from the product of a farm of 110 acres.

Mr. Murphy: Why do you not raise your own pigs as well as your cows?

Mr. Gould: Because it would not pay me on my small place to keep eight breeding sows. I can do better by buying the small pigs, when I can get them for $2.50 or $3 when about six weeks old. I have to buy feed for the pigs, but not for the cows. I trade oats for the bran, and so do not have to buy even that. (Laughter and applause.)

The President: Lewis Harris claimed to keep 30 cows, besides a large number of hogs, on 100 acres, and that in the days before we had corn ensilage. I went over there into New York State to visit him, and was splendidly treated by that grand old man. He met me at the station with a covered buggy, and brought me to his fine home —handsome wife, a beautiful daughter, splendid piano, everything elegant. (Laughter.) Just before five o'clock we went to his barn, and along came the cows, walking right up to Mr. Harris and rubbing their heads against him, as if to ask him to open the barn door. He opened the door, and in went Betsy, and Mary, and Jane, and all the rest of the herd. The milkers were ready, but before doing their work all had washed their hands with soap and water, and had used a clean towel. Every milker had his or her own cow to milk every time. They had to mind this, for a cow is as jealous as a woman. (Laughter.) Each cow wanted to have her own milker, and wished to be milked exactly at the same time each day. After milking, each cow's milk was put on the scales, and Betsy was duly credited with her yield, Mary with hers, Jane with hers, and so on. Every item of gain or loss was noted. Mr. Lewis also kept a bacon account. He was getting about $500 or $600 a year for his swine product. He had the best of everything to sell, and he had also the best of everything to eat at home. He was making money in dairying because he had selected the right kind of a cow, and was giving her right treatment, and the animal was given a fair chance to do the best she could. It pays to keep a record of what your cows are doing for you. It means more system, and more sound practice. I have attended many factory meetings, and have tried to get patrons to see the benefit of knowing just what an animal or herd is doing. I have gone to the blackboard, and have shown them that John Jones was getting only $14.92 per cow, while his next door neighbor, with better judgment and wiser practice, was getting $60 per cow. One of these $14.92 men once said, "Dang the cows; they're no good, anyway!" (Laughter.) I think I can hear the $60 man say, "The cow is the salvation of the country." This last man bought plenty of bran, saved all the droppings in his stable to replenish fertility, and housed his cows carefully. Every dairyman in this country ought to do just what Mr. Gould has told you to-day. With the added prosperity

we would soon pay the national debt. It would mean added wealth not only to the farmers, but also to our towns and cities. What Mr. Gould has done every other dairyman may also do by following similar methods.

Mr. Gould: The value of bran for manurial purposes depends a good deal upon the condition of the stable. We now cut all our straw as we thresh it. That cut straw is used as bedding, and everything that drops from the cow is taken up by it. That manure is taken to the field every day. That is why I can produce more from my fields than my neighbors can.

The President: If you feed a ton of bran to the soil in the manure, the nitrogen which you replace is worth more, at the price nitrogen is valued, than what you pay for the bran. It seems strange to say it, but where nitrogen is badly needed in the soil what I have said as to the great value of the manure from bran holds strictly true. Then there is the benefit derived from increased crop. Give your cows plenty of bran, and you will not need to send the dog after them at milking time. What brings the husband home at the stated time but the warm welcome prepared for him by his wife? (Laughter and applause.)

DAIRY CHEMISTRY.

By Prof. R. Harcourt, O.A.C., Guelph.

The subject which has been assigned to me is not one of my own choosing, but one which your programme committee no doubt thought would be congenial to me, and wide enough, after all, to allow of a very wide choice of subjects.

The work of the chemist has been of material assistance to dairying in the past; for it is through his efforts that we have our present knowledge of the composition and digestibility of the cattle foods used in feeding dairy stock, which, along with a chemical study of the requirements of an animal, has done so much to put cattle feeding on a scientific basis. It is through his efforts also that we know so much about the composition of the various products of the dairy, and that we are able to talk as intelligently as we do regarding the proportion of fat, casein, ash, and water in milk and its various products. But, however much the work of the chemist may have done for dairying, more remains to be done. We do know in a general way the composition of milk; but we know comparatively little about the changes that take place in its various constituents when it is made into butter and cheese. We know that by the use of rennet we can coagulate milk, and that by following a certain line of procedure cheese can be made; but we understand very little of what actually takes places during the process of manufacture, and the cheesemaker is compelled to go on making cheese largely by rule. It is true that intelligent observation and careful attention to practical details have made it possible to produce a fairly uniform quality of cheese; but, after all, how much is really understood about the various changes in the process of manufacture? Acid is developed—too much or too little are both injurious; but we do not know how much there should be. Casein is changed, we do not know in what way; for it is not known exactly what casein is to start with. The green cheese must be "cured" or "ripened" before it is fit for consumption. The question naturally arises, What is this curing? We know that cured cheese is more digestible than the green article; but regarding what these changes are; what conditions are most suitable for the curing; or even what causes all these wonderful changes, we know practically nothing. It does seem strange that, although cheese has been used by man as an article of food for centuries, we are still ignorant of the cause of the "breaking down" of the curd which takes place in curing. The most eminent authorities differ on this subject. Some claim that the curing is caused by the moisture in the cheese, others that it is caused by the acid developed during the process of manufacture, others that the pepsin of the rennet does the work, and still others that it is a ferment natural to the milk which causes all the changes. It is very likely that some day it will be found that it is a combination of all

these. It is evident, though, that until we know more of the chemical changes, both in the manufacturing process and in the curing, it will be impossible to thoroughly understand cheesemaking. It will thus be seen that there is a large field open for research both to the chemist and to the bacteriologist—a field that can only be covered by the chemist, the bacteriologist, and the practical man working hand in hand.

At the Ontario Agricultural College these three Departments are working together trying to reach a solution of some of the problems already mentioned. Drs. Babcock and Russell of Wisconsin, and Dr. Van Slyke of Geneva, N.Y., are also working along these lines, and it is to be hoped that before long some valuable information will be obtained which will be of assistance in controlling the making and curing of cheese.

Your President has said that what is wanted in this meeting is good practical talks that will be helpful to those that are engaged in this great industry. Let me, then, give you the results from the practical side of some work which was undertaken by the Dairy, Bacteriological and Chemical Departments of the College. The object of the work was to study the germ life, the chemical changes, and the effect on the quantity and quality of the cheese when cured at different temperatures. The plan of the experiment was as follows :

Fifteen hundred pounds of milk was made up in the usual way, and after salting the curd was evenly divided between five different hoops. On taking the cheese out of the hoops they were dated and lettered A, B, C, D, and E. A was at once placed in cold storage and kept at a temperature of 38 to 40 degrees. The other four cheese were placed in a curing room at 65 degrees. At the end of one week B was removed to cold storage, at the end of two weeks C was placed in cold storage, and at the end of three weeks D was placed along with A, B and C. The cheese marked E was allowed to remain in the room at 65 degrees. This experiment, with a few exceptions, was repeated every week from April to November, so that altogether some twenty-five lots were made. Samples were taken regularly for chemical and bacteriological analysis, weighings were made to determine the comparative shrinkage, and the cheese was judged from time to time by experts to ascertain the effect on the quality.

The chemical and basteriological results are as yet so incomplete that it would be unwise to say anything about them here. The results of the effect of the low temperature in curing on the yield and quality of the cheese, while incomplete, point so strongly in one direction that we feel safe in bringing the results before the meeting.

First, regarding the yield of cured cheese, I may say that from the weighings made, it was found that the cheese cured at a temperature of 40 degrees lost less moisture than those cured at a temperature of 65 degrees, the shrinkage being 2 per cent. more at the latter temperature than at the former. Or, in other words, there was two pounds more water retained in every 100 pounds of cheese cured at 40 degrees than there was when cured at 65 degrees. The percentage of water was determined in a number of samples of the two classes of cheese when they were from two to three months old. The average of the determinations showed that the A cheese (those kept at 40 degrees from the time they were taken from the hoop) contained 32.72 per cent. of water, and that the E cheese (those kept at 65 degrees from the time they were taken from the hoop) contained 30.72 per cent. of water. These results show that there is two per cent. more water in one than in the other, and confirm the results got by weighing the cheese.

Regarding the quality of the cheese, I may say that on the 21st of September three experts scored all the cheese made between April 26th and July 25th. When the average scores of the three judges on the five classes of cheese was obtained it was found that the highest number of marks were given to A cheese, the one which had been taken directly from the hoop and placed in cold storage at a temperature of 40 degrees. The others followed in the order in which they had been placed in cold storage, with E, the one cured entirely at a temperature of 65 degrees, last.

On November 11th some cheese four months old were sent to Montreal, where they were scored by seven experts, who also placed them in the order in which they had been placed in cold storage.

The cheese cured at a low temperature are more moist, and have a milder flavor, and appear to be nearer what the old country market is demanding at the present time.

It is worthy of note that the chemical analysis shows that the amount of casein which has become soluble increases with the longer time the cheese were kept at the higher temperature. Measuring the ripeness of the cheese by the amount of casein which has become soluble, three and a half months at 40 degrees appeared to be equal to one month at 65 degrees.

From the preliminary results, which cannot be considered as final, we may safely conclude that the prospects are favorable for curing cheese at so low a temperature as 40 degrees. It is not claimed that this is the best temperature ; but so far as this work goes, better resuls have been obtained at 40 degrees than at any higher temperature.

Dr. Babcock has got good results in curing cheese below the freezing point of water. At the present time it is impossible to say what is the best temperature at which to cure cheese. That point is still open to investigation.

The chief advantages of the low temperature curing are : Greater uniformity of product, less loss of weight in curing the cheese, improved quality of cheese, and the fact that the manufacturers of cheese are independent of hot weather conditions and unofavorable markets.

The President : Are cheese taken from the press and put at once into cold storage for curing as good generally as those cured in a good curing room for ten days or two weeks, and then sent to the cold storage curing-room ? I am of opinion that the last described method will give the best general result.

Prof. Harcourt : Our experiments have gone to show that putting the cheese directly from the press into cold storage is the best.

The President : We have found that if put into the cold storage direct from the hoop there is a tendency towards bitter flavor. We find that cheese kept for a week or two before being put into cold storage curing-rooms will have that desirable nutty flavor.

Mayor Graham (Belleville) : I have been experimenting with cheese in cold storage for eleven years. I have a factory or two and a storehouse, and I buy more or less cheese. My experience has shown me that keeping cheese for twelve days and curing at 38 degrees would develop a bitter flavor. We have found the best results with cheese taken out of the factory at about ten days, and then kept at a temperature of about 45 degrees. I have also found that there is a difference in the effects of cold storage on white and on colored cheese. White cheese can be kept at a lower temperature than colored cheese. The latter kept at 38 degrees will not retain its color like white cheese, for if kept at that temperature for five or six months much of the color is apt to go. Therefore colored cheese should be kept at a higher temperature than white.

J. A. Ruddick : I have seen a number of samples cured at 40 degrees. I heard Dr. Babcock state that the cheese he had cured at 40 degrees had a most excellent flavor when eight months old—in fact he described it as first-class. Last November I attended a meeting at Morrisburg, and saw some cheese exhibited by Mr. Wm. Eager which had been made in July and kept in a cold storage curing-room at 38 degrees. There were two cheese, one white and one colored. At that time they had been out of cold storage about eight days. The colored cheese had never been as good as the other, but so far as any other difference was concerned I could see nothing marked. There was a slight tang there that had evidently existed from the beginning. I believe that the point has not yet been determined as to what is the best temperature to produce the best quality, and it is my opinion that different cheese would require different temperatures and different treatment. The matter of moisture may have something to do with it. Now there are two sides to this question : the purely scientific side and the commercial one. The latter is to determine whether we can afford to pay the cost of keeping cheese at this low temperature, for it will cost something extra to keep cheese in cold storage rooms for four months at a temperature of, say, 40 degrees. Of course the im-

proved quality of the cheese may give a value that will much more than pay the extra outlay. I saw some cheese that Dr. Babcock cured at a temperature of 20 degrees—below the freezing point. It was then eighteen months old, and had been out of cold storage for some time, yet it was of excellent flavor. It had never been turned over in the curing room, however, and had got a little pasty on one end. Otherwise it was a fine cheese. That was a revelation to me, for I had always believed that cheese could not be kept for any length of time under the freezing point of water ; I thought that it would be destroyed. When the cheese were a few weeks in cold storage they had an appearance as if frozen, but afterwards that appearance left them, and they became smooth and nice looking. I am now of opinion that cheese can be safely made with more moisture and cured at this low temperature, and yet keep its flavor. I think I am quite within the mark in saying that the saving in shrinkage alone will pay for all the expense and time it takes to cure cheese at a lower temperature, as indicated by the methods brought before your attention to-day.

Mr. A. W. Woodward, Dairy Inspector, Department of Agriculture, Ottawa, was asked to give his opinion on curing-rooms, and said : In connection with curing-room experiments conducted under the direction of our Department, we found that the results were practically the same as those reported by Prof. Harcourt. However, we did not cure our cheese in exactly the same way as they did at Guelph We did not compare an ordinary temperature with a low temperature, but rather compared a medium temperature with a high temperature for curing cheese. In our plan three lots of June cheese were experimented with. One was cured at 65 degrees or under ; another at 80 to 83 degrees, and one in a room where 91 degrees was at one time recorded. These cheese, after curing, were put in storage at Montreal at a temperature of 38 degrees, and held there till November. It was found that the quality of the cheese varied in exact order according to the temperature of curing, that cured at 65 degrees being the best, and that at the nineties the poorest. The commercial value of the cheese cured at 65 degrees was placed at a cent a pound above the commercial value of that cured at about 90 degrees, and half a cent a pound more than that cured at 80 to 83 degrees. There was, furthermore, a difference in shrinkage between cheese cured at 65 and 94 degrees of one pound per box in favor of the lower temperature. A good deal would also depend upon the temperature at which the cheese had been kept after making and before being put into the cold storage quarters. As I have said, our results have been very similar to those described by Prof. Harcourt, although our experiments were not carried so far as those at Guelph were.

The President : A factory making, say, 2,000 boxes of cheese would pay for this extra cold storage equipment in one year. The man who is not prepared to fit up his factory so as to meet this new requirement of the business should get out of the trade.

Mr. Gallagher : At what time of the year were these cheese made at Guelph ?

Prof. Harcourt : In the early part of the season, running from July to August. We have the cheese for the rest of the season until November in cold storage yet.

Mr. Gallagher : Then the plan is best for hot-weather cheese ?

Prof. Harcourt : Yes; although we find that cheese made in April and July are very similar in quality when taken out of cold storage. Some of the cheese that went off at 65 degrees never developed when placed in cold storage at 40 degrees—that is, the same make of cheese. We have noticed in our work no bitter flavor like that complained of by Mayor Graham. We do not say that every cheese kept at 40 degrees will give the best results ; but we have found that such cheese gave us the best results. There was only a slight difference between the cheese placed in cold storage immediately and those put in there within a week. Had these cheese been first kept at 80 degrees for any length of time before being put in cold storage I would expect to see a considerable difference in their quality.

A Member : Should each cheese factory have a cold storage room ?

Prof. Harcourt : No. The cheese could be sent to a central place. The keeping of them for a few days would not make much difference.

The President: If I was a patron I would force the maker to put his curing-room in the best possible condition. The patrons, after all, are the men who must settle the matter. You must have the best curing-room available or you will fall behind in the contest. With properly constructed curing-rooms most of the poor cheese would soon disappear.

CREAMERY LEAKS.

By J. W. Hart, Superintendent Eastern Dairy School, Kingston.

Those gigantic industrial combinations of the United States, commonly called trusts, while they are monopolistic, and hence dangerous to the public interests, possess features that are worthy of imitation in so far as they aim to reduce wastes and to cheapen manufacturing processes. If the dairy business could be organized into a great monopoly under efficient management, a great many of the petty leaks that make up such an expensive aggregate could be stopped, but it is doubtful if the producer or the consumer would benefit by the change. In order to be effective a trust must kill off competition, after which it will proceed to collect the funeral expenses from its customers. Under free competition, for a variety of reasons, there is not the same incentive to reduce wastes and cheapen manufacturing methods. Like the rain from heaven, these losses fall alike upon the just and the unjust, and except in isolated instances they are not noticed, or are considered the legitimate outcome of the business. Certain it is that a large amount of hard-earned money is being wasted in the dairy business. The preventable losses are probably greater in the creamery business than in cheese manufacturing, because the making of cheese in the factories has been carried on for such a length of time, and competition between neighboring factories is so keen. Self-preservation has made it necessary to reduce the wastes.

Directly as we are able to lower the cost of manufacturing the finest quality of butter, and our patrons begin to realize (for they are only beginning to realize) the high feeding and manurial value of skim milk, we hasten the time that our butter export trade will stand in the same proud position as our cheese trade to the mutual advantage of both. Again, as compared with the methods of our competitors in the world's dairy markets our ways are often wasteful and extravagant, and we must mend them if we are still to continue to march in the van guard of the procession. It is in the small manufacturing establishment with unsuitable buildings, poor equipment, and employing cheap and inefficient labor, that we find the largest proportional wastes. In not a few creameries and cheese factories, the best way to stop the leaks would be to close up the buildings and to transfer their patronage to their neighbors. Some buildings are in such an unsanitary condition that they are utterly unfit to make butter and cheese in, and nothing but fire will purify them. (I hope that this remark will not be construed as inciting to incendiarism).

The cause of creamery leaks may be set down primarily to false ideas of economy and to incompetence and inexperience on the part of the management. Patrons fail to realize the extent of the unnoticed losses, but all the same they are important, and amount to such a large total that were the truth known it would not be believed by many that such a state of affairs could be possible. The proprietor of a creamery hesitates to put in machinery that would enable him to make better butter at less cost. It might be taken as an indication of prosperity, and he would be invited to cut down his already low charge for manufacturing. If he should hesitate to do so, he would probably find that a rival concern would be started in the same neighborhood, and two creameries crippled for lack of milk would have to be maintained at a loss, where one might handle the milk with economy and profit to all. In co-operative creameries (so called) leaks and wastes may be more serious because it is nobody's particular business to look after them. If the butter-maker is ignorant, careless and lazy, he will most assuredly be a much more expensive man than an intelligent, careful and energetic

butter-maker whose abilities probably command double the wages. Perhaps the greatest leak in creameries is inefficient skimming, through using inferior separators, or on account of one or more of the following :—Over-feeding the separator, separating at too low temperatures, the bowl not running steadily, or at too low speed. A separator that will skim 3,000 lbs. of milk in the spring, should have its capacity cut down to 2,500 in the fall to do equally clean skimming where the speed and temperature remain the same. The skim milk should be tested daily, and the information gained by testing the skimmilk should be used in regulating the various factors that go to make clean skimming. With a good separator intelligently run the loss of fat in the skim milk, as compared with the loss in running a fairly good machine by a somewhat careless operator, might amount to one-tenth of one per cent. If the creamery received 8,000 lbs. of milk a day the loss of butter fat in a year would amount to 2,400 lbs., which, at 20 cents a lb., would be valued at $480. This is by no means an extreme case, and it is likely that the loss of fat in skimming would have to be considerably greater before the patrons commence to comment upon it.

In churning, wastes occur through imperfect ripening of the cream, churning at improper temperatures and through foul and leaky churns. Another frequent source of loss is the energy wastes in badly designed and poor constructed buildings. The buildings and machinery should be arranged with a view to economize labor. Wooden floors, on account of frequent renewals and the difficulty in keeping clean, are too expensive for creameries. Cement floors are superior in every way. A wooden floor, no matter how well built, will settle under the presssure of a vat of milk and throw the separator out of level, resulting in unsteady motion, imperfect skimming and increased wear on the machine. Many expensive separators have been consigned to the scrap-pile because they were not set upon a good solid foundation and properly taken care of. If a machine is not being used for a time, all the bright parts should be covered with hot tallow or cheap vaseline. If a turbine, the step bearing should be taken out, wiped dry, oiled and replaced.

Refrigerators are often too large and not well built, causing the waste of large quantities of ice. Damp, moldy refrigerators are a common source of loss. In covering ice in the icehouse, wet sawdust, or an insufficient quantity is often used, resulting in rapid melting of the ice. Improper lining of shafting, light shafting or too few hangers cause increase in friction and loss of power. The same results follow where the belts are not run at the proper tensions. The over-loading of machinery results in increased wear and tear, if nothing more serious happens. Sufficient oil, and no more than will keep the bearings properly lubricated, should be used. The experienced creamery man should have his ear so attuned to the ordinary noise of the machinery that he will quickly detect any unusual sound, so that he may find out the cause in time to prevent an expensive and annoying breakdown. Very frequently machinery is in use that absorbs a great deal of power in doing little work, as where an engine, shafting and pump have to be run to elevate skim milk from the separator. Leaking unions and valves waste steam, and should be attended to. Common valves, that cannot be kept tight, should not be used where high pressure steam is carried.

The boxes and bearings of the engine should be kept carefully adjusted and lubricated, and the slide valve should be set to cut off at the proper place in the stroke. For heating it is often possible to use exhaust steam, which will effect a considerable saving. In using exhaust steam a back pressure valve should be placed on the direct exhaust pipe of the engine. Besides the indirect waste of fuel that has been indicated, there are more direct wastes on account of boilers not being properly bricked in, and by having boilers improperly set ; by allowing them to get scaly and dirty, also through priming.

Some of the more direct wastes in fuel will now be considered. The return flue tubular boiler is a more economical steam producer than the upright or locomotive type of boiler. Furnace and flue doors should shut tight, so that no air will be admitted except what is drawn in under and through the grate bars, except that where fresh coal is added to a fire it will be an advantage to admit a little air above the fire in order to

ignite the generated gases. Some time should be taken to get up steam in order to prevent waste of fuel and to allow the metal to expand gradually and equally. All sudden expansions and contractions of the boiler, or any portion of it, weakens it and shortens its life. The water level in the boiler should be kept as near stationary as possible, and the water should never be allowed to fall below the tops of the flues; leaking flues usually and serious explosions sometimes result from neglect of this practice.

A ton of good hard or soft coal will produce as much steam as one cord of hard together with one cord of soft wood. Although wood is still largely used in our factories and creameries in the older settled portions of the Province, it is becoming too expensive to use for steam production. To use green or wet wood is extremely wasteful, as the contained water has to be converted into steam, requiring a large excess of fuel. To argue that green wood is the more economical shows that something is lacking, perhaps the furnace is in such a dilapidated condition that it is impossible to control the fire. For burning coal the furnace should be smaller and the grate bars heavier and closer together than for wood.

At the Kingston Dairy School egg coal used to be the principal fuel, although some wood had to be used at times when a heavy demand for steam was made upon the boiler. By putting in herring-bone grate bars which were raised about a foot higher than the old bars in the wood-burning furnace, we are now able to get more heat out of a mixture of hard and soft coal screenings in equal proportions. As the best hard coal costs $6.25 delivered, and good wood $5.00 a cord, we are saving about 50 per cent. in our fuel bill by burning this mixture, which costs us $3.00 a ton.

The principal heat-producing constituents of fuel are carbon and hydrogen. In burning, the oxygen of the air combines with these elements, resulting in heat. Carbon unites with oxygen in two different proportions. When improperly burned carbon monoxide, a colorless gas, is formed. One pound of carbon, together with the necessary oxygen to form carbon monoxide, will evaporate 4½ lbs. of water at a temperature of 212 degrees. Completely burned or converted into carbon dioxide one lb. of carbon will supply over three times as much heat, or sufficient to evaporate 15 lbs. of water at boiling point. Hence the necessity of a sufficient supply of air to the fire. Hydrogen has a much greater calorific value than carbon when burned. When burned with oxygen to produce water, one lb. of hydrogen is sufficient to evaporate 64 lbs. of water at 212 degrees.

In smoking meats the fuel is partially distilled, and smoke and various gases are given off unburnt. In a similar manner fuel may be wasted by bad firing. The dense volumes of smoke which pour out of smoke stacks indicate great waste. Soot and smoke are nearly pure carbon expelled by the hot gases from the furnace, and show a lack of skill in firing. To admit more air than necessary for perfect combustion is also wasteful on account of the cold volume of air reducing the temperature and adding bulk to the gaseous products of combustion. To assist in the conduction of heat from the fire to the water in the boiler, the bottom of the boiler and the flues inside and out should be kept clean. If a deposit accumulates in the bottom of the boiler it will act as a non-conductor, and the metal will be burned out or blistered. Using steam at a low pressure is another wasteful practice. Sufficient heat is absorbed in changing one lb. of water at 212 degrees into steam of the same temperature as would heat 966 lbs. of water one degree Fahrenheit. This is termed the latent heat of steam, and where the steam pressure is low much of the fuel burned is used in converting water into steam instead of increasing the efficiency of the steam already generated. Covering steam pipes to prevent radiation should be more generally practised, especially where the steam has to be carried long distances.

While the list of creamery leaks has not been by any means exhausted, no mention having been made of such obvious losses as those taking place through leaky faucets and vats, or the reductions in the feeding value of the by-products on account of dirty skim milk tanks, through holding goods for higher prices, the occasional dishonesty or failure of buyers, the injurious effects of high temperatures upon the quality of the goods, and many others more or less serious, enough has been said to show

the nature and extent of the losses, and that they are almost entirely preventible. But it is only by eternal vigilance that this can be done. First-class machinery should be put in and a first-class buttermaker should be hired to run it. The all-important point is for creamery patrons or proprietors to get a competent and conscientious buttermaker if any reasonable inducement will attract him. He must be a man who is making a study of the many problems connected with dairy matters, who by attending conventions, taking part in the discussions, keeping his patrons interested in and informed upon dairy topics, and by subscribing to one or more dairy papers, evinces his interest in his work. He must be a close and critical observer, and his judgment should be ripe and keen enough, so that he will draw correct conclusions from what he sees. All these things he may do and be and still fall far short of the mark. To his knowledge he must add zeal, and must carry that energy and enthusiasm into his daily work that will enoble it and make it characteristic of the man, honest and thorough and as near perfection as human brain and hands can make it. When such a man is found, it is the very acme of folly not to hire him for a few paltry dollars saved in wages, when many times the difference will be lost if an incompetent man be employed. Thoroughness is the keynote, and with thorough instruction in the best methods, followed by thoroughly honest, conscientious work in the creamery, success is sure.

Mr. Sprung : Do you use a starter ?

Mr. Hart : Yes ; we pasteurize the cream. We like to use plenty of starter when separating very rich cream. We use 10 to 15 per cent. of starter. We get the bacteriologist to furnish us with a pure culture or starter, although occasionally we use Hansen's pure lactic ferment. We select the best milk that we can get in using a starter, taking about four pounds of it, and if it turns out well we perpetuate it, just as a baker does good yeast. We sometimes find considerable trouble in getting just the flavor we want; but once secured we are careful to keep it as long as possible. This starter is for cheesemaking. In buttermaking we take buttermilk made from pasteurized milk, and we run it up to a temperature of 160 to 180 degrees. If it goes off flavor we use the pure lactic acid that I spoke of. Sometimes we use the hand separator for getting a starter. If you get your starter over-ripe it will coagulate. We find, however, that buttermilk used as a starter will not hold the flavor for more than two or three weeks, and therefore we change about every couple of weeks. If I were running an independent concern, and had to depend upon my own resources, I would make my own starters. We find, also, that we can separate more readily at 160 degrees than at a lower temperature. We have tried all the way from 60, 70, 80, 90 and 100 degrees, and increased to 170 and 180 degrees, and have found that the efficiency increases with the temperature up to about 160, or even 170. The milk runs through faster.

A Member : We find that pasteurized milk does not give as rich a flavor to butter as the unpasteurized milk does.

Mr. Hart : That may be, but you can get rid of the more undesirable flavors.

Mr. Green : The milk dealers at Toronto desire unpasteurized cream rather than pasteurized cream. They want the very best care taken of it.

A Member : What about November milk ?

Mr. Hart : We got milk of good flavor in November. There was plenty of grass then.

Mr. Gallagher : How high would you go in temperature when using a separator ?

Mr. Hart : If you run it above 190 degrees the steam will run through the pasteurizer and blow it out. I would not advise going any higher, or even as high as that We run the cream directly over a cooler, and cool it down to churning temperature as sooon as possible. We used to cool it down to a temperature of 40 or 50 degrees, but now we cool down to only 70 or 75 degrees, and run it through at once. We do not need to watch it all night, like a sick baby. I like quick ripening. I prefer 65 degrees, and cooling it.

Mr. Green : Why not use more starter, and ripen at a lower temperature ?

Mr. Hart : We churn at a lower temperature, and have the advantage of clean churning, and we have no loss of fat. We churn at 52 or 54 degrees, with about 35 per

cent. of cream. We find the body of the butter just as good. We have the facilities for cooling. It must be cooled for several hours. However, if you leave it to cool over night it will ripen, and you will not get such good results. Always cool it at once.

Mr. Green : How long does it take cream to ripen ?

Mr. Hart : About eight hours in our case. I might have reason to modify that if I was situated like a great many creameries are. We do not chill it below churning temperature.

A Member : What is the average temperature of cows' milk ?

Mr. Hart : That would depend. About 100 to 115 degrees.

A Member : How about running the separator fast or slow ?

Mr. Hart : I have found that when running the separator at a great speed considerable cream will flow over in a sort of fine spray; it will even get upon the window panes. It is a sort of condensed cream. Of course it is not a large amount. We finish the cooling process at once when it leaves the separator, by running it right over the cooler.

Mr. Sleightholm : Why do a large number of creamerymen pasteurize the cream instead of the milk ?

Mr. Hart : We do not pasteurize the cream. We think that if there is any injurious bacteria in the milk the sooner it is dealt with the better. We have to elevate the milk whether or no, and so it means but little extra trouble to pasteurize the milk.

Hon. Sydney Fisher, Dominion Miniser of Agriculture, after expressing his great satisfaction at being present, the hon. gentleman proceeded to say: I have been at many of your gatherings in various parts of the country, and I do not think I have ever seen so large and appreciative an audience on the first day of the Convention. I understand that the section surrounding Whitby is not so largely a dairy district as are other parts of the Province, yet I think the local interest in dairying will develop after this gathering, and there are many here who have come to learn all they can about this great industry. I wish to lay before you some reflections which have come to me regarding the dairy business of this country; more especially some points regarding the handling of the products of our cheese factories and creameries. One or two things have come up at this convention which are well worth our greatest consideration. Prof. Harcourt has given us the results of a most interesting and valuable series of experiments in curing cheese at the low temperature of 40 degrees, as compared with higher temperatures. Mr. Woodward has given us results of experiments in curing cheese at high temperatures—from 60 degrees and upwards. The former seem to me to be more an investigation for the future to a certain extent. The Guelph College experiments, while most valuable, could be applied only where cold storage equipment was in vogue; but those experiments described by Mr. Woodward deal with conditions at present confronting us. Your President was right when he said that it was practically throwing away money to make cheese in a factory where the temperature could not be kept to at least 65 degrees. The cheese trade of Canada to-day is in a critical condition, and something has to be done immediately by the people who are engaged in the dairy business if we are to retain the proud position we have so long occupied in the British markets in connection with our cheese. Therefore, I would ask all those who have control in cheese factories to see that immediately—within the next season—their curing-rooms are so equipped that they can keep the temperature at about 60 degrees—certainly not above 65 degrees. Mr. Hart has been describing certain little leaks in the dairy industry. These are due in many cases to the carelessness of the workers, and often to the carelessness of those who control the business. Owners of factories should not permit these leaks to go on. Care requires to be exercised by the man whose money is put into the business. Mr. Hart also drew a picture of the ideal maker, the man who in any place in Canada would be worth from $1,000 to $2,000 in any industry. (Applause.) How much are your makers getting ? I understand from $300 to $500 a year. How, then, can you expect to get such men as have been referred to when any other industry will commend their brains and energy and skill at a higher rate of wages? Mr. Hart has also shown that the waste alone would pay the extra wages of the men, and put money into the

pockets of owners of the factories and creameries as well. Our creamery system must move in the direction of larger factories, which can better afford to pay for such ideal men, as those described to-day—men who will know how to stop these wasteful leaks. It is always inspiring to me, as Minister in charge of the Department of Agriculture, to come to such a gathering of dairymen as this is. What I see and hear while with you helps me very much in the great work that has been placed under my charge. (Applause.)

CREAMERY AND CHEESE FACTORY BUILDINGS.

By J. A. Ruddick, Chief of Dairy Division, Ottawa.

It must be admitted by everyone who knows the dairy business at large that a great many buildings in which butter and cheese are being made are more or less of a makeshift character, and it seems to me that the time has now arrived when a greater measure of permanency, as well as of efficiency, should be given to the buildings in which our dairy products are made. It was so a few years ago with farm buildings, but we all know that within the past ten years there has been a very great improvement in the direction of durability and suitability, and the owners of these better buildings are finding it to be an advantage from an economic as well as from other standpoints.

The matter of drainage and water supply should be given more attention when sites are being selected for cheese factories and creameries. Sites for these buildings have been chosen too often without proper consideration of these two most important points. In the older countries they pay more attention to these matters. In Denmark especially, the buildings are put up with a view to permanence and also to sanitary conditions, and they pay a great deal of attention to the question of drainage. The laws of Denmark compel every factory to have a closed tile drain to carry the drainage to a sufficient distance from the creamery or cheese factory, to avoid risk of injury to the product. I know cheese factories in Canada where there is always danger of contamination owing to defective drainage.

We do not pay sufficient attention to the surroundings of our cheese and butter factories. There is generally a lack of attractiveness about these places, although we sometimes find a man who takes a pride in making his factory surroundings look neat and inviting. I have seen a lawn, with some flowers or shrubs, or a few flowers in the windows; but too often there is absolute carelessness and indifference regarding such matters. Neat and attractive surroundings have the effect of giving an improved tone to the whole neighborhood; it seems to have an unconscious effect for good upon those who supply the milk, and to inspire them to send it in better condition. It seems to me that the farmers of any district should look upon the cheese factory or creamery as a part of their farm equipment, and they should take as much pride in having that factory well built and looking well as they would about any portion of their own place.

The matter of putting in a concrete or cement floor is a question that should be considered by every creamery and cheese factory owner in Canada. Mr. Hart has already shown you the advantage of these floors. For a long time I was prejudiced against this class of flooring for dairy buildings. I had seen some which were failures, and had come to the conclusion that it was an impossible thing to construct a cement floor that would remain in good condition. However, I went to New Zealand a few years ago, and I found there that every cheese factory and creamery had cement or concrete floors. They had to use such material there, as their wood decays rapidly, and costs a great deal. The men who make the floors have had a lot of experience, and the work is now done very well. These floors are very much like the concrete sidewalks of this town, and are very permanent. A cement floor must be well constructed, or it will be a very poor floor indeed; it will crack soon, the surface will wear off, and it will go to pieces generally if not laid down with skill. Of course wooden floors are nicer to work upon, but from the standpoint of durability and sanitation the cement floor is much ahead of the

wooden floor; it will last a lifetime if properly built, while a wooden floor will only last about five or six years. It is impossible to have proper drainage with wooden floors, on account of moisture dropping through and soaking the ground below.

The cost of a cement floor would be about ten cents a square foot, which for a building 75 x 30 would amount to $225, while a wooden floor for the same area would cost about $150. In the case of the cement floor you have one that is permanent, while in the case of the wooden floor it would have to be renewed in five or six years.

It has been brought out very clearly to-day that we should give more attention to the construction of our curing-rooms, and that we need rooms that will have more or less of the nature of cold storage buildings. It is important that the temperature should not go higher than 60 or 65 degrees.

I think there has been too much value given to what is called the "dead air" space in insulation. As a matter of fact, it is impossible to get a true "dead air" space. If the space is over half an inch in width better results will be obtained if such space be filled in with some non-conducting material. Refrigerating engineers have found that out. Of course if air could be kept perfectly still it would be the most non-conducting part of the wall; but it has been shown by the best authorities that if the space is more than half an inch wide there will be a movement; the heat will be carried by convection and not by conduction. One of the best materials for filling spaces in walls for insulating purposes is what is called mill shavings. Sawdust is not nearly so good, being more liable to get musty. Experiments by cold storage engineers have shown that for wall construction eight inches of mill shavings, with two ply of lumber and one ply of paper on each side is equal to eight boards, four ply of paper, and three dead air spaces. By having double boards on the outside, with paper between, and one board and paper in the inside, we have a very good construction for a cheese factory curing-room, and it would not be expensive. Then this filling of shavings should be carried over the ceiling and down both sides without any break, and even under the floor. The paper used in such construction should be of the waterproof kind, to prevent dampness getting into the wall and thus destroying its insulating properties.

I have spoken of the cement floor for the curing-room. I am assuming that we are to keep the curing-room at a temperature of 60 to 65 degrees. A cement floor is a good conductor of heat, and as it rests upon the ground it will carry off the heat very rapidly, transferring it to the earth below. The temperature of a cement floor will always be near that of the earth itself, and will not go much above 60 degrees at any time of the year. A room with a cement floor can be kept at a low temperature a good deal more easily than one with a wooden floor.

Then there is the matter of doors and windows. These should be close fitting. Otherwise it is a good deal like building a water tank with openings at some point through which the water leaks. The object of such a building is to keep the heat out. Of course it would be impossible to construct a building which will altogether prevent heat from coming in, but an improvement can be made in the matter of windows and doors, for too many curing-rooms have badly fitted windows and doors through which the heat enters rapidly. Standing beside one of these windows in cold weather you soon feel the cold air coming in, and if cold will enter during winter, you can depend upon it, the heat will come in during the hot weather. I would advise having windows with solid sash, and would provide for ventilation in some other way. Have double doors fitted as closely as possible. The same thing is true of the creamery, only that it will pay in that case to put in more insulation.

A weak point in many creamery refrigerating-rooms is that the floor is not water-tight. Water will find its way through the floor, soaking the insulating material, and thus the power of insulation is more or less lost.

A cement floor, while of great value in a cheese curing-room where the desired temperature is very near to that of the floor upon the ground, is not at all suitable for a creamery refrigerator, where a much lower temperature is required. That quality of high thermal conductivity which makes it useful in the curing-room condemns it for the refrigerator.

The best floor that I have ever seen used for such a purpose is constructed something like the deck of a ship. Two-inch plank are slightly beveled on the edges, so that when laid the upper side of the joint presents an opening about one-quarter of an inch wide. This space is tightly caulked with oakum, leaving half an inch or so to be filled with hot pitch (not tar).

This Whitby section is not yet known as one of the dairy districts of the Province, but there is no reason why it should not be one in the near future. You will be able to benefit by the experience of those in the older dairy districts. You will not have to repeat their mistakes, but you may repeat their successes. It is true that in the manufacture of butter and cheese profits are cut pretty close, but there is a fair margin if proper buildings are erected, fitted with good machinery, and employing men who are properly trained. In various parts of the country we have such conditions already existing —good buildings, good equipment, and good makers and managers. Remember that in this dairy industry it is a matter of economy to make things permanent.

Mr. Sprung: Would you not prefer brick walls to cement walls for foundation?

Mr. Ruddick: a brick wall does not of itself afford very good insulation. The heat will pass through it. Yet a brick wall might be so constructed as to be satisfactory.

Mr. Sprung: I have brick walls to my building, and the temperature has never gone above 72 degrees.

WELCOME BY THE MAYOR.

At the evening session on Wednesday the Opera House was packed, half of those present being ladies. An orchestra rendered popular selections from time to time, and local vocalists gave solos.

Mayor Ross gave a hearty welcome to the members of the Association. He considered it one of the most important gatherings that had ever taken place in that town.

The President made a reply in his most genial manner, which was loudly applauded.

Wm. Ross, M.P., made a short address. He congratulated the members of the Association upon the success of the Convention, and declared that he had been so interested in the proceedings so far that he had decided to remain for all the sessions. In fact, he had become a member of the body. (Applause.) In travelling through a portion of Eastern Ontario, more especially in the Perth district, he had noticed that a great deal of the country was given over to pasturing and dairying. Where there was dairying there was more or less of prosperity. He hoped that the practice of dairying would spread to the County of Ontario. The Eastern Dairymen's Association was doing a good work in disseminating valuable dairy information, and in instructing those engaged in the making of cheese and butter.

W. H. Hoyle, M.P.P., also welcomed the Convention to Ontario County in a brief but very witty speech. He considered dairying one of the most important industries in the Dominion. A reference by the speaker to the apparent falling off in the imports of Canadian butter into the markets, as given from British sources, drew out the explanation from the President and the Hon. Mr. Fisher that the British authorities credited the consignment to the port of shipment, and that where the Canadian butter was shipped from American ports, the United States, and not Canada, was given the credit. A resolution regarding this matter was introduced later on.

A WELCOME AND A MESSAGE.

By Hon. John Dryden, Minister of Agriculture, Toronto.

I ask permission to join with Mayor Ross in extending to you and to your workers in connection with this Association a most hearty welcome to the town of Whitby, which is, as you know, the capital of the rich and famous County of Ontario. I do not wish that my words should be merely personal, for in this respect I represent the Government of Ontario which is delighted to know that you are willing to come so near the capital, and especially at the time when the Legislature is in session. Several of the members of the Legislature are here to-night, and others may drop in upon you. Your presence so near indicates that you are not afraid of the criticism of those who annually vote the supplies that keep up this Association.

This is the first time you have left your place of wisdom, may I say, in the east, among the dairymen of that part of the Province, and tarried so near to the western limit of your territory. You have not many supporters in this district, for it has not in the past been a dairying county. Therefore, we understand that you come among us as missionaries, declaring the gospel of dairying, not merely as a mortgage lifter (though it has lifted many a mortgage in the east and also in the west), but because of the pure products for which your Association stands; it is a source of blessing to all. For the reason that our people have not devoted themselves to dairying in the past, we are not ashamed or afraid to say that we need the information this Association can give. We need the stimulus and enthusiasm which always follow in the wake of the annual meetings that have been held in the past.

I want specially to congratulate you, and with you the people of this town, on the great success of the meetings so far, and on the splendid audience which greets us all here to-night. You remember, Mr. President, what I promised when urging you to come to this district. I promised that you should have the choice of several good hotels at which to rest; I promised that you should have a splendid hall, well seated, well heated, lighted and ventilated, for your meeting; and I also promised that you would have good audiences. I am glad to know that every promise given has been fulfilled, and I am sure the President will be willing to say that he is now glad that Whitby was selected.

One cannot but notice that you have in the audience to-night two distinct classes; first, those who have been or may be producers; and, second, those who because of their peculiar circumstances must always be consumers of the products presented by the first class. But I wish to impress upon you that both classes are interested in the same result. The first class desires to obtain the greatest amount of money for the product they present for sale; the second class desires to obtain the greatest value possible for the money they pay. In either case, the desire can only be reached by the presentation of a superior product. In that way only can the consumers get good value for their money, and in that way only can the producer receive the greatest amount; so that the interests of both are identical. Because of this interest, the residents of the town are here in large numbers to manifest by their presence their inferest in the work you have in hand, and to give added strength and enthusiasm to your gatherings. Looking into the future of our country, it strikes me that it is a good omen to find the inhabitants of town and country willing thus to intermingle in a gathering of this kind, and to unite their influence in making the work in hand a success. I think I may say that the time has gone by in this country when men of brains and talent and education are to be found only among certain classes, and these classes always finding their habitation in a town or city. And I hope public opinion will bear me out in saying that the time has come when no honest work is considered to be menial or degrading, and when intelligence and skill will be praised and commended, just the same when it is seen in a pound of superior butter or a package of the choicest cheese as it is when it is seen in

the teaching of a class in Euclid in your Collegiate Institute or in delivering an eloquent sermon in one of your pulpits on Sunday. If either of these things be done well, it must be because in both cases much intelligence, much thought and much labor have been given to it. There is no room for improper discrimination. Each of these is a necessary part of the whole unit, and each is performing a most important work; and, therefore, I plead for the recognition in each of the same intelligence, skill and industry when it is manifested.

This is the age of industrial enlargement and enterprise. Never before in the history of the country have we witnessed such a development as is taking place to-day. It is not seen merely in the frontier towns and cities, but it has extended away into the northern parts of our Province. Places where a few years ago we found nothing but a wilderness are now converted into villages, towns and even cities; and in this respect we believe we have only commenced. One thing brings another, and we shall expect this industrial development to continue. It is found now that the highest attainments in education are brought to bear in conducting the practical business of these concerns. In my early days I was wont to think that the only object there could be in mastering certain subjects was that the person who did so might be competent to teach ohers, and that such subjects were of no practical utility. It may be I was mistaken in thus thinking; but it is perfectly certain now that we find the educated chemist, the successful students in geology, bacteriology, and other kindred subjects, are sought for, and brought into requisition, in carrying on the work of the most prominent business concerns of the country. They are not only brought into requisition, but they are paid large salaries, and the heads of these business concerns do not seem to think they could reach the prosperity they desire without them. The new milk company in the city of Toronto; the Wm. Davies Packing Company, Mr. Clergue in connection with his enterprises at the Soo, and many others, all employ these talented scientists. The rule of thumb, guess, and chance is gone. These men require accuracy, definiteness and certainty in their productions. The same thing must be true in the dairy industry, represented by this Association; educational equipment is demanded in connection with every branch, and the education which is being given is turned to the practical uses I have suggested.

I should like to say just here that we must not despise the man who succeeds to-day in his business, even without the advantages of schools and colleges, which some of us have enjoyed. He has acquired a practical education by his own observation and by his own experience. It may be he would have been immensely better off if he had had the advantages of an education ; but I could take you to a man in this county who never learned to read or write, and yet has become a splendid manager on his own farm, and is acknowledged to be one of the best farmers. Because he has done this, I would not despise him, even though he be not educated. Only a few days ago I was reading of two farmers living near each other, one an educated man, and the other uneducated. But the educated man was not as prosperous as his neighbor. He believed in the education of his family, which was certainly right, and they were sent to school and college. On one occasion, one of the boys having returned home, and during his absence having learned something more of the live stock industry than he had previously known, was more interested in what he saw at home and on the farms of the neighbors. He noticed how superior the herd of swine on the neighbor's farm was to that on his father's farm. He went over to inquire for the reason. He found his neighbor mixing the feed. He asked him questions, but he did not seem to acquire much information, for the same feed was given to the swine on his father's farm. Hence, he asked another question: "Is there anything more than what you have told me?" The old man quietly said: "Yes, there is something else; I always try to mix in a little brains with the feed; but you know that is a scarce article over at your farm." Here was the crucial point. The educated man had not learned to make practical use of his education, and hence he did not succeed as well as his neighbor who was practical, but uneducated, so that when it came to feeding swine the uneducated man would rank as a professor as against the other.

In this country, as well as in others, we are more and more tending towards technical education. This means an education that can be put to the practical uses of life; and the children are being turned away somewhat from the books they study to the things that are about them on every hand. The results we have achieved in past years are not sufficient; it is desired to move forward in every line of industry, and this practical education will be of much assistance in this direction. Every year we are facing new difficulties and new problems. The experience of the past does not reach them, and we must therefore resort to scientific investigation. It is not so very long ago that within the precincts of this Association great trouble was found in the fact that in some of the factories where good cheese had been produced in former years, it could no longer be accomplished. It was called "rusty" cheese. Streaks of a reddish brown color were found running through it. Men of experience made guesses, suggested improvements, and changes were tried, but nothing seemed to affect the case, and it was not until a scientist from Queen's University, Dr. Connell, was given the problem to solve that the difficulty was discovered. He found the ugly germ which caused the trouble; he found its home, its breeding ground. He was able, having secured the germ, to produce the rusty cheese. He suggested the remedy, which was to remove the pipes and troughs leading to the vats and in their places to put new ones, which would be perfectly clean, and to renovate the factory generally. After this was done the difficulty disappeared. So that really the cause was a lack of cleanliness, but there did not seem to be any lack so far as the owner of the factory was able to discover.

This year another trouble has visited us. In some of the factories in the County of Oxford—factories that produced superior cheese in the past—they could produce only a sample that was declared by buyers to be entirely "off flavor," and the milk was sometimes of a bitter taste. The result was that a large reduction in price was demanded Experienced men could not discover the cause. Professor Harrison, of the Bacteriological Department of our College, was given the task of unravelling the mystery. Although I have not yet seen his report, I am told he has discovered the cause, and that he will be able to explain both the difficulty and the remedy.

I have only to say that these professors who make a study of these things must be in the public interest at your service, and I am glad to say that I have secured for the present season added help in both the chemical and biological departments, and that part of the time at least of one man will be given to similar work in the future.

In closing, I desire to congratulate you on the dairying output of the past year. To have scattered among the community nearly thirty millions of dollars is no small item of added wealth to our country, and while it is a fact that the cheese industry has decreased somewhat, we are all delighted to know that the butter industry has almost equally increased, so that on the whole, it is a subject of congratulation. May I say that all our people—because the distribution is made through those who dwell upon the land—have received their share of this added wealth. I hope that the coming season will see the production of better goods, and that you will have steady prices. If so, then I may be permitted to say that the dairy industry will contribute its share towards making the year 1902 what you have all been wishing it might be—a happy and prosperous New Year. (Applause.)

THE CANADIAN DAIRY INDUSTRY.

By Hon. Sydney Fisher, Dominion Minister of Agriculture, Ottawa.

After a few introductory remarks, in which he complimented the people of Whitby and vicinity for the manner in which they had turned out to the meetings of the Convention, the speaker said: One of the most encouraging features of agricultural progress in Canada during the last few years is the great strides made in dairying. The status of this branch of farming has risen to a higher plane than ever in the history of Canada. The work of men like Hon. John Dryden, Prof. Robertson, President James Mills, Mr.

Hodson, and the men belonging to the Live Stock and Dairy Associations has helped to make the name of Canadian agriculture honored abroad as well as at home. Our dairy industry has been making extraordinary progress within the last few years; so much so that it has attained easily to the first position so far as the material progress of the country is concerned. Our agricultural products now stand at the head of the list of our exports; in fact, about half of the value of our exports come from the farm. In the dairy industry especially has the increase been enormous during the past few years, particularly in the amount exported. In the year 1896 we sent to Great Britain only $12,000,000 of cheese; but in 1900 it had reached $17,000,000, although in 1901 it had fallen to $13,000,000. Even this last amount is something to be proud of. Our butter industry, however, has shown a more enviable record. In 1896 we sent $1,890,000 worth of butter to Great Britain, while last year we sent over $6,000,000. (Applause.) In the English table of imports all articles and values are credited to the country from whose port they last came. As many of our exports go by way of the United States, that country gets the credit instead of us of such shipments. The difference between the amount of butter credited to us for the last year by the British tables of import and the amount actually exported from this country to Great Britain is the difference between $3,100,000 and $6,000,000, or, say, $2,300,000 in our favor. (Applause.)

However, I have now to speak a few words regarding a phase of the work that is not satisfactory. While we have made a great advance in our exports of butter to Great Britain, we have dropped off about $4,000,000 in our export of cheese. In other words, there has been a net decrease in the dairy exports of Canada for the year. Of that $4,000,000 decrease in the export of cheese about half was due to decrease in quantity, and about half to decrease in quality and price. Our butter is now generally acknowledged to be among the best brought into the British market, and while it has been gaining steadily in reputation during the last few years, our cheese is not holding its own either in bulk or in reputation. Now, we have to face this question; we cannot put it aside. If we ignore it we will find that the proud position we have held for years of having sent about 60 per cent. of the entire import of British cheese will be lost.

What has been the course of this great cheese trade? Thirty years ago we exported hardly any cheese. Most of our cheese were then made in private dairies. Since that time the co-operative factory system has been generally adopted, and we are now sending great quantities of cheese abroad, more especially to England. This system permitted the milk of many farms to be brought to one central factory and be handled by a skilled operator. It was not long before Canada had the reputation of making the best cheese on the continent of America, and eventually we nearly monopolized the cheese imports of Great Britain. We conquered that position, but I must be frank now and tell you that we are in danger of losing it to-day unless we make an earnest effort to retrieve our place. And how shall we reconquer that position? Our cheese has always commanded a fair price in the British markets, compared with competitors generally, but to-day it averages four cents a pound less than the price of English home-made cheese. Now, why cannot we make as good cheese as they do in England, and command just as good a price? The best experts in both England and Canada have been investigating this question for a few years back. I may say also that the officials of my Department have received hundreds of reports from all over England, and these reports say continually, "Your cheese it not up to the mark." We are finding heated cheese, badly cured at too high a temperature, much of which goes bad as soon as it leaves the factory. The great exporters of Montreal also frankly acknowledge that the cheese made this year is not up to the quality of that made a few years ago. Prof. Robertson and Mr. Ruddick have also been warning dairymen concerning this matter for the past few years, and we believe that we are now in a position to find a solution for most of the trouble.

Let me again say that as we conquered our position in the British markets in the first place, so also must we re-conquer what we have been losing there. Co-operation helped us out in the first place, and it is to co-operation that we must look

to-day. I am of opinion from all that I can find out that the chief cause of the deterioration in quality of our cheese is the uneven and high temperature at which most of our cheese is cured, kept and carried. Experts inform us that it is not so much the actual process of manufacture that is to blame so much as the temperature at which the cheese is kept in the curing-room, the temperature in which it is kept in store, and the temperature while in the holds of the vessels which bar that cheese to the British markets. Those who are familiar with the manufacture of cheese well know that there is a bacteriological process constantly going on in the ripeuing of the article. The higher the temperature the more rapid and the more injurious the process of ripening becomes. If, therefore, cheese be kept in the heated, ill-ventilated hold of a vessel during the process of ripening it is manifest that bad results must follow. I have asked the owners of steamship lines to put in cold-storage arrangements for the carrying of our butter. They informed me that so far as cold storage on board ships was concerned it had not been profitable for ship owners, although it had brought profit to the shippers of agricultural products. However, there is a difference between cold storage in closed chambers for the butter trade, and a system adapted for the carrying of cheese, which was simply a ventilated hall, so that cool and pure air might come in and hinder any injurious process during the carriage of cheese in the hold of the vessel. This plan has been put into three ships during the last fall, and the results were so satisfactory in the shipment of cheese and apples under the direction of Prof. Robertson that we are now trying to arrange with the companies concerned to put them into all their vessels. I hope that next year we shall see fifteen or twenty ships sailing from Montreal fitted with such a system of cold storage and ventilation as will carry our dairy and orchard products in such an improved condition as will tend to give our agricultural products the very highest place in the markets of Great Britain. (Loud applause.)

It frequently happens, also, that much of the injury comes to the cheese while being taken from the factory to the warehouse. I have seen cars in which I would not have cheese carried. I am, however, making arrangements with the railways to give better service in this respect, and I believe that the improvements promised when given will give satisfaction. The railways, in their own interests, must see to it that the cars they furnish will protect cheese from the heat of the sun. I firmly believe that as they have done so well in carrying our butter and fruit, so also will they do well in the future carrying of our cheese. (Applause.) The difficulty of the railways in providing adequate rolling stock is one that must be considered in this connection. Hon. Mr. Dryden spoke of the wonderful development of the country, and wonderful it has been. In fact so great has its growth been that the railways have found it impossible to meet the development of progress, and our country is to-day actually suffering from lack of rolling stock and other railway facilities for carrying our trade. It is to be regretted that our facilities have not been able to cope with the transportation this year, and is not likely to overtake it next year.

At present in most of the cheese factories of the country there is no adequate provision made for curing cheese in the proper way. The great majority of our factories cannot make really first-class cheese because they have not the right sort of curing-rooms. I again ask, why is it that English summer cheese is worth four cents a pound higher than Canadian summer cheese? Mainly, I believe, because the temperature of that country is even; it seldom rises above 75 degrees, and for weeks and weeks is nearer 70, and so the cheese maker has a more easily controlled temperature than in our own case. There is scarcely a cheese factory in Canada in which the temperature does not rise some day in August high enough to hurt the product that may be in the factory at that time, and so long as our factories are like that so long will we run the risk of losing the cheese trade of Great Britain.

Now, we started the cheese business by adopting the principle of co-operation. It has been suggested that if milk is carried to the factory to be manufactured there into cheese, so also should the cheese of every group of twelve or fifteen factories be

sent to some central well-built curing-room, to be kept there until such time as by the slower process of cold storage it had ripened in just that condition required by the market. I believe the plan could be carried out with great advantage to all concerned. From what I know of the dairymen of Canada I feel assured that they will not rest content until they have found a satisfactory solution of the matter. Such a central curing-room might serve from fifteen to twenty-five factories, and would not cost more than $5,000 or $7,000. I venture to say that such a plan of curing cheese would be so satisfactory and beneficial, and there would be such an improvement in quality, as well as gain from loss of shrinkage, that the cost of erection would be paid in a single year. (Applause.) I believe, also, that cheese so cured would be of such a character and quality when placed upon the English market that not only would we regain our reputation of a few years ago, but we would soon command there exactly the same price that their home-made cheese does now. (Applause.) But we have never commanded that price, because our September cheese, though well made, has been too often lumped with our July and August cheese, which had been heated so as to be hurt in quality—and all were placed on the market as the best Canadian cheese, thus injuring the reputation of our best make.

I think it is the duty of an organization such as yours to weigh, and sift, and ventilate, and work at just such questions as I have brought before your attention. See that they are taken up and discussed, and keep at it until the remedy is applied. The Departments of Agriculture at Ottawa and Toronto are at your service, together with the staffs of the Agricultural College and the Experimental Farms. If you finally decide that a certain course of procedure is best, you may depend upon it that in my capacity as Minister of Agriculture I shall do the best I can to lead you in the matter. (Applause.) I make bold to say here to-night that if something is not done to meet these difficulties of curing and carrying our cheese, then our cheese industry will suffer in the future even more than in the last year.

The President: If the two Governments will do all they can, as indicated in Mr. Fisher's address, they can depend upon it that this Association will see the matter through just as far as it is possible for it to go. (Applause.)

A WESTERN VISITOR SPEAKS.

By Andrew Pattullo, M.P.P., Woodstock.

The speaker, after a few introductory remarks, in which he chaffed the President about the Brockville and Woodstock districts respectively claiming to be the "original home" of Canadian dairying, proceeded to say: I was delighted to hear Hon. Mr. Fisher speak to you in the very candid maner in which he addressed you, even though there was what might be called a tone of pessimism in his speech. I believe that tone of pessimism was necessary, if we are to cope with the dangers that threaten the cheese industry. I believe he has not only indicated the danger, but he has also shown the way in which it can be avoided and overcome. I was also pleased with Hon. Mr. Dryden's remarks regarding agricultural education. We have had two systems of education in this country. We have the ordinary public, high school and university system; but did it ever occur to you that we have also a system of agricultural education which has gradually developed into a system of education quite as important, if not more important, than the work of our high schools and our universities? What are the objects of this meeting? The members of this Association go to the great trouble of arranging for this gathering, why? Simply in recognition of the fact that education is power. There is no sphere of usefulness in which education spells power more largely than in the domain of agriculture. The system of agricultural education which we are developing in this country is of more importance than our public schools, high schools, and universities. We have, in this connection, not only the best Agricultural College in the world, but we have what

may be called a system of university extension work—a system in which the same sort of education that is given at the Agricultural College is carried to people who are unable to attend that institution. This university extension work is carried on through conventions such as this, through the Farmers' Institute, and by other like means.

The importance of the educational work carried on is strikingly illustrated by the figures given in the President's opening address. This Association is 25 years old; for 25 years it has been carrying on the work of education along dairying lines. To-day, our dairy exports are valued at $25,000,000, or $1,000,000 for every year this Association has been in existence.

This is something more than a mere financial matter. But for the creation of this industry, which owes its origin to two or three men, Mr. Farrington of South Norwich, and Prof. Arnold being two of them, there would be tens of thousands more of our people in the United States to-day. It is dairying that has saved the situation. We have had our up and downs in every line save that of dairying. Grain-growing has had its up and downs; our horse interest has gone up and down; every industry except dairying has had its period of depression. But, in all the years since dairying was first established there has been but one in which that industry has not given profitable returns.

We dispute somtimes as to who are the nation-builders. It has been said that the man who makes two blades of grass grow where but one grew before is a benefactor of mankind. A still greater benefactor is the one who causes the production of something where nothing was produced before. We are merely on the fringe of our possibilities in this matter. The production of the soil can be doubled right here in this country. You can produce $1,000,000 more in cheese than you are producing now; and, so far from lessening your other farm products by so doing you will rather increase them.

Mr. Pattullo also said he felt quite sure that in a few years time there would be 50,000 Americans coming into Canada, and closed by an eloquent peroration describing a view of Naples as recently witnessed by him.

PRACTICAL CHEESEMAKING.

By G. G Publow, Instructor at Dairy School, Kingston.

Perhaps some of you makers here think from what has been told you about low curing that the only thing necessary for the making of first-class cheese is a good cold-storage room for curing. Now do not run away with the idea that cold storage is the only thing required for successful cheese-making. I would like you to understand at the very outset that while cold storage is a necessity, it is not a cure for all the evils. You must also have a good building to make your cheese in, and have good milk sent you from which to make that cheese. I do not believe that you can take inferior milk, manufacture it into cheese, put it into cold storage, and get a good article. If it can be done I would like to see it performed.

In making cheese it is requisite that there should be a well-built factory for the purpose. What is wanted in cheese is good texture and flavor, and the right texture and the proper flavor can be got only from good milk. I like to receive the milk in such sweet condition that at the adding of the rennet it will give me sufficent time to expel sufficient moisture and has acid enough—acid enough to pull apart, and be firm and alive. If the milk is over ripe it will be difficult to get this desirable condition. If milk has to be handled quickly at the factory it means loss to the patrons. Use enough rennet to have the milk coagulate and fit for cutting in about 25 minutes at a temperature of about 86 degrees. Cut the curd as soon as it will split clear over the finger of some smooth instrument. I usually find this condition in about twice and a half the time the first signs of coagulation show. If

it takes ten minutes for adding the rennet allow twenty-five minutes for thickening up. Cut the curd carefully, and into cubes of uniform size. I do not care which knife you use first, if the cubes are of uniform size. Commence stirring immediately after cutting the curd. I prefer an agitator. If you stir by hand you are apt to stir the curd into balls. Stir gently, to ensure against loss.

In cooking, it is well to remember that this should be done according to the amount of fermentation that has taken place in the curd. There has been too much stress laid on cooking the curd at ten or fifteen minutes, or at half an hour. If you find that it will shrink rapidly, then cook rapidly, but if it will shrink slowly, then cook slowly. It may take an hour, or it may take only fifteen minutes. When the proper amount of moisture has been expelled it should give you a good body and texture. Be sure that the curd is what we call "lively."

As to temperature you will have to use your own judgment. In some cases 95 degrees may be sufficient, but it may take 102 or even 104 degrees; it will depend largely upon the richness of the milk. In the spring take a lower temperature, and as the season advances you will have to increase it. Cook it sufficiently long enough to get a proper condition of the curd. The amount of acid in drawing will depend upon the amount of moisture in the curd, as the acid develops from the moisture in the curd. If you have too much moisture the curd will break down, and there will be an injury to the texture. If you take out too much moisture the curd will be too dry or "corky," and never become meaty cheese.

Mat the curd so that it will mature evenly. I do not care whether you pile it one, two or half a dozen; only pile it in such a manner that the temperature and the moisture will be uniform throughout. Keep the temperature at 96 degrees from the time you draw the whey until you have an inch and a quarter pull on the hot iron. Then mill the curd. The condition of the curd at that time should be mellow and meaty, and when you tear it apart it should show a fibre like lean meat. Mill the curd with a machine that will cut the curd into uniform pieces. Immediately after milling expose the curd well to the atmosphere, stirring it for about fifteen or twenty minutes. Then let the curd rest. Next stir occasionally, and keep piling the curd higher until it shrinks and will be soft and pliant and mellow, and tear off like a piece of meat, and have a nice, fresh-butter flavor. If it is not so treated it will likely be rubbery, and will make an open cheese. The maker should have his sense of touch educated, so that he may tell by the feel of the curd whether it is in proper condition or not. The warmer the curd the more mellow it will feel.

When the curd has reached the condition just described I would salt it. In cheesemaking the best salt is none too good. In applying the salt put it on evenly and slowly, so that all the curd will get a fair share, and that it will thoroughly enter the curd. I would recommend a hair seive for putting on the salt. Stir the curd well at the time, and keep it well apart. After the salt is well dissolved, and the curd has become mellow, it will be ready for the press. When hooping curd aim to have the same quantity in each hoop for the sake of uniformity in the size of the cheese. Keep the curd well up in the centre, so that when the pressing comes it will be more evenly distributed. Then take the cheese out of the press and dress them neatly. See that the bandage is even. If the curd has been oilly, wash it well with warm water, or wrap a cloth around the edge to absorb the fat. Put the cheese back into the hoops and press gradually for about an hour. Then let them remain in the press until the next morning. If the cheese have any shoulders on take them off. If you find that the cheese are not in good shape, wash them and put in the press for two days. Then put the cheese on the shelves at not more than 65 degrees, and keep as near that or 60 degrees as possible. Turn the cheese every day, and see that there is plenty of moisture in the room. If you attend to these instructions I feel sure you will have no complaints from the Montreal buyers.

Mr. Echlin: Does not high piling make the fat run out more?

Mr. Publow: Slow piling would be better; but it takes too much time.

Mr. Echlin : Then you think that the waste from fat in curd is largely due to some cause such as dry pasturage ?

Mr. Publow : Yes; something of that sort.

A Member : What about racks ?

Mr. Publow : I believe that if there were more racks used there would be a better body in our cheese.

Mr. Echlin : Would not an ordinary cheesemaker find a difficulty in making cheese one day on the rack and another day in the pan ?

The President : Don't have both; stand to one or the other.

Mr. Publow : The man who is using racks can always give a little more moisture; if you are on the pan you have a drier cheese. The great trouble to-day is that there is lack of uniformity. The racks do not stir quite so dry; if you did you would have to give a little more acid. If on the pan you can make more firm with a little less acid. The object of the maker should be to retain the proper amount of moisture and the proper amount of fat. The maker should have in mind just the kind of cheese he wants to make—whether the cheese is to be mellow in two or in six weeks. If you want it mellow soon you must have more moisture; if to be mellow in six weeks, then it must be a little drier. Why is it that some of our cheese is reported back from England as "Fancy" and "Good," while other cheese shipped in the same boat—in the same consignment—are poor ? The trouble lies right here : You are asked for soft cheese that will break down in Montreal in about two weeks, and these are shipped to Great Britain under the same conditions that firmer cheese are sent. (Applause.) We want cold storage, and I hope that we will get it both on the trains and on shipboard, but we must also see that the maker produces the kind of cheese that will keep and carry.

Mr. Echlin : If the first fifteen days are the most important in the life of a cheese, are we asking for something unreasonable in putting so much responsibility on the transportation companies ?

Mr. Publow : Patron, maker, buyer and carrier must all work together. Each and all of them have a large amount of responsibility, and should live up to the full measure of it. But very, very much depends upon the early days of the curing of cheese. The cause of curing is fermentation, and if you get the right fermentation it is less likely that the cheese will go bad in transportation.

Mr. Ryan : Do you believe that mellowing down curd will make any difference in the quality ?

Mr. Publow : That very thing itself is a process of curing. The curing is continuous, and the process goes on in the vat. After you cure you get the curd firm The changes are still going on, the cheese is becoming softer, and the more you cure it the softer and more mellow it will be. I believe in curing the curd well before you salt it or press it.

Mr. Newman : What would be the chief advantage of cold storage for cheesemaking ?

Mr. Publow : If we had cold storage we could send a moister cheese; we would have that advantage by having a longer time in which to cure our cheese.

Mr. Newman : Must we have less moisture in making under the cold storage plan ?

Mr. Publow : That will be a matter of experience and judgment. If you hear good reports of your cheese—that it is mellow and meaty in a reasonable time—then it will be all right. But stop making so as to have a mellow cheese in two weeks. Make them firm, cure them mellow, and then send them to market. A cheese should break down in about a month.

Mr. Newman : How much milk should it take to make a pound of cheese ?

Mr. Publow : With the average milk it should run from about 10.4 to 10.6 lbs.

Mr. Newman : Some say eleven pounds.

Mr. Publow: There is something wrong when it takes eleven pounds of milk to make a pound of cheese. Most of the milk that goes to the average factory will range from about 3.2 to 3.4 of fat.

Mr. Blick: Do you think it is fair to judge by any one section? We ship every week; some ship every two weeks. We often have our dividends for the month made up the 15th. The cheese going into cold storage would not give us so rapid a return, and our cheese would go into cold storage with those that go every two weeks.

Mr. Publow: That is an argument in favor of uniformity. If there was a man going about for a syndicate, and looking up steady shipments it would be a great advantage. I would advise you to stick to the Peterboro' quality of goods. Don't go back on your present plan. Improve it if you can. Let your motto be "Quality first, yield afterward."

Mr. Ryan: How long should cheese be left in the room before shipping?

Mr. Publow: I believe that under good conditious cheese should stay in the home factory about fifteen days. Turn them every day, and see that they are kept clean and neat. If you have some place where they can he kept at a lower temperature of course you could let them leave the factory sooner.

Mr. Blick: We never ship before ten days.

The President: We must have uniformity. The best way is for every maker to attend one of our Dairy Schools. Then when they go home they cau make a uniform quality of cheese. The instruction in these schools is as free as the air you breathe.

Mr. Ruddick: Mr. Publow has well said that there is no more critical point in the making of cheese than the regulation of the moisture. Nearly all the manipulations that take place in the manufacture of cheese have something to do with the amount or control of moisture in the curd, and the fine balance is one that calls for the greatest skill that the cheesemaker can exercise in his work. I would not, however, have the impression go out that all the complaints against the quality of our cheese are on account of the too great amount of moisture left in the curd. There have been complaints in some districts about the cheese being too dry. This has been the case with some of our western Ontario cheese. Too little moisture gives a harsh, dry, crumbling cheese. Then there is a mealy condition in hot weather cheese that you find when the curd has had too much acid. In most cases, however, the trouble is with cheese going off on account of too much moisture being left in them. Last season and the season before there were complaints of too many open-bodied cheese. These were made during the sudden cool weather, and not enough acid was allowed to develop before the cheese was put to press. I would like to ask Mr. Publow what variation he finds between making in spring and in late fall?

Mr. Publow: From about four to six degrees. About 96 degrees in the spring of the year, cooking in about two hours and a half after the adding of the rennet. Weakness in cheese is largely the result of lack of judgment on the part of the maker. If you would have your cheese right you must have the right body at the time you remove the whey and when the salt is added. If the curd has too much moisture and is breaking down fast, it will make a weak cheese with too much acid. They will be a little open and too stiff. Too many makers are using a quick starter, working the curd very fast, and by so doing they are destroying the texture of the cheese. The trouble is that too many of them want to get the cheese out too early.

Mr. Newman: Even in a properly built curing-room will there not be a time in midsummer when it will he so warm that it will require some artificial means to reduce the temperature to the best working point?

Mr. Publow: In my district there are twenty-five factories that have adequate means of controlling the temperature. Two had sub-earth ducts. One worked well and the other did not do satisfactorily. In all these twenty-five factories I found good cheese. Most of these factories have put up an ice-house beside the factory. Some of them have racks on the top shelves, and some a few feet from the floor.

These are just scantling on the edge, with a pan below to catch the drippings from the ice. They put them in the centre of the building, keeping the boxes full of ice, and the arrangement works well generally. If you use ice, put it in early. Do not wait until the cheese are beginning to go off from the heat. Fix the building first. It is no use of having an old shell of a factory and putting ice in there.

DAIRYING FROM A QUEBEC POINT OF VIEW.

By H. S. Foster, President of the Bedford District Dairy Association, Knowlton, Que.

We are confronted to-day with something that has never before faced us. This great danger to the success of the dairy industry is the lack of uniformity in our cheese. I live in the Eastern Townships of the Province of Quebec. You in Ontario set us the example of co-operative dairying in the first place, and we look to you now to take the lead in grappling with this present day difficulty of uneven quality in our cheese product. We have too many cheese factories in our district. There is hardly a factory there that has the milk of more than 500 cows. I believe we should haul milk by contract, and have the milk of 1,000 or 2,000 cows for each factory. I have been trying hard to do this in the Eastern Townships, but so far with but little success. We recently had an address from a Glasgow exporter, in which he told us that there was a factory in Ontario known as the Black Creek factory for which he had paid one and a half cents a pound more than for that made in any other Canadian factory. That factory, he said, turned out about sixty cheese a day during the making season. The consolidation scheme mentioned by Mr. Fisher is capital in the meantime, but I think the time is very near when all of our factories will have to be larger, and each of them have this equipment. Our butter interest during the last year has increased almost double. But while we have sent out a comparatively large volume of butter, there is also some difficulty here also on account of the smallness of the factories. We must have larger and better equipment in both our cheese factories and creameries.

When I heard the unfavorable reports regarding the cheese markets last season I thought it was on account of the exporters having stepped over the limit in the previous year, but Prof. Robertson has assured me that it is chiefly because of the poorer quality of the cheese made and exported. But we have produced a fine quality of cheese in the past, and I think we can do so again. (Applause.) We must organize our factories on a scale that will warrant the employment of experts who will be able to solve this problem of a better and more uniform quality of cheese.

It is plain to everyone, however, that one great hindrance to the success of the dairy industry is the lack of proper treatment of transportation. In the Eastern Townships of Quebec, where we are depending almost entirely upon one railway line, we are kicked about just as that corporation likes. I think the time will soon come when the people of this country will rise en masse as the people of the United States did, and will settle this question to their own satisfaction. I am delighted to learn that Hon. Mr. Fisher and the Government are going to take up this matter of better transportation for our agricultural products. It is only just to the producers and shippers that our freight rates should be put on a lower and fairer basis. I have been much pleased with the good work done by this Association. You have been an inspiration to us in Quebec. The production of winter butter is becoming more and more important. With us in the Eastern Townships there are many advantages for butter making. The country is hilly, and there are plenty of springs and fine pasturage. But the great trouble with us is that we have been letting the cows milk for only a few months in the year. Let us urge more dairy work in the winter months, for that is the time it pays best.

The question of ventilation is also an important one. I have devised a plan which is now in operation on three farms that have come into my hands. It is the result of a series of experiments, and I think it now works satisfactorily. Mr. Forster then explained in detail his plan. It consists of a series of tubes running from within a foot or so of the floor up to and out of the eaves, on each side of the stable, and which are opened or closed according to the direction of the wind. He had lately put in this method in a barn of 40 x 100, where they had 55 head of cattle, and it is working admirably. He added: I can recommend my plan of ventilation. In fact, I will pay any man who will put in this system for himself if he does not find it a success. It does not disturb anything in the ordinary barn or stable. It enables you to take advantage of whatever way the wind is blowing. It is also a cheap system of ventilation. Let me again thank you on behalf of Quebec dairymen for your kind reception of me at this grand convention. (Applause.)

BACTERIAL INFECTION OF CHEESE.

By Dr. W. T. Connell, Bacteriologist, Queen's University, Kingston.

It has been my privilege to come before various meetings of this Association and to address its members upon the relationship which bacteriology and bacteria bear to dairying. So to-day I am going to continue this series of addresses and speak on the old topic of the "Bacterial infection of milk, its sources and result."

It is hardly necessary nowadays for me to remind the audience that bacteria are minute microscopic plants which increase exceedingly rapidly in numbers by a process of fission, i.e., simple division, when they are placed under suitable food and temperature conditions. Given these favorable conditions for their growth and vast increase they will rapidly bring about changes in any material upon which they are developing, and lead to various fermentative or putrefactive changes. Milk is a very good food material for a number of species of bacterial plants, just as it is a good food material for man and animals. If these species make their way into milk and the temperature conditions are favorable, then they will rapidly multiply in the milk and bring about changes in it.

In the same way curd and cheese afford fairly good food material for bacterial development, though not so good as milk. Butter is not a good bacterial food when it is properly made, but when it holds large amounts of buttermilk then it becomes a better foodstuff for these plants, and a poorer one for the human consumer.

It will surprise none of you to learn that in both cheese and butter making bacteria are essential and necessary. In fact, upon their presence, growth and action depends the acid production in the making of the cheese, which acid is so essential both in the course of manufacture and in the process of curing. In butter making bacteria are essential to the ripening of the cream, and thus play an important part in the production of the flavor of the butter. Both these processes are dependent upon bacteria which produce lactic acid without at the same time breaking up the sugar present into gases and putrefactive compounds. In our cheddar cheese and creamery butter of first quality we find bacteria of these species present alone, and such species must be looked upon as the natural or desirable forms. I have found that in Eastern Ontario at least these forms all belong to one species known as the B. Acidi Lactici (Esten) (No. 208 of Conn, or Hansen's), and that these species are present in the vast majority of all milk when it arrives at the factory or creamery. They are not present in all samples of milk, and are often when present not found alone, but mixed with other species, though in most good milk they are the dominant micro-organisms.

Where do these bacteria, that are so requisite in cheese and butter manufacture, come from, and what are their results? Prof. Conn, in 200 examinations of milk, di-

rect from the cow, where the milk was collected into sterilized vessels with a narrow neck, found this species only five times, but when the milk was collected in larger vessels he found this organism in almost all cases. He concludes from this that the bacterium is not derived from the milk ducts of the cow, but falls in from the air and dust of the milk shed or stable. Other experimenters have, however, had a larger percentage of cases where they found these lactic acid bacilli in fresh-drawn milk when very carefully collected, so that it is reasonable to suppose that these bacteria are not uncommon inhabitants of the teats of the cow, and are washed out with the first streams of milk drawn. That infection also occurs from the air and dust of the stable there can be no reasonable doubt, yet experiments made by the exposure of materials upon which these bacteria could grow have very rarely been followed by positive results. Another source from which there can be no doubt that infection of the milk with these bacteria frequently comes is from the milk pails and milk cans themselves. Of course, where these are carefully washed and scalded such an occurrence would not be common, but when such care is not taken, and particularly when sour whey is brought home in the milk cans, such a source of infection must be exceedingly common, and would be increased still more if the cans were not perfect, i.e., had cracks or roughened surfaces in them. Thus it will be seen that the cheese and butter maker who employs no starter practically depends for the seeding of the milk with the proper acid forming and ripening bacteria upon the farmer and his cows. Right here comes in the importance of the proper care of milk. If the milk is kept at a high temperature we find the conditions are favorable to bacterial development, while if the milk is kept cooler, say down to 60 degrees F., the conditions are not so favorable, though development will go on slowly. If a milk has been seeded with the common souring bacteria and the temperature is 75 degrees F. over, it would not take many hours for the milk to become over ripe or actually sour. Kept at a lower temperature still it would take double or triple the time to produce the same result, and the lower the temperature goes the longer will milk keep. Most large milk companies who supply milk for drinking and household use demand that their dairymen cool their milk as rapidly as possible after milking and preserve it at a temperature under 55 degrees F. It is not necessary to be quite so radical in butter and cheese-making, but milk for butter-making should be cooled to 60 degrees F., while for cheese-making 65 degrees F. to 68 degrees F. should be required. Many cheesemakers might say that if all milk were cooled and preserved at these temperatures that the milk would take a long time to ripen and to develop acid. I would say that I would rather ripen milk where I alone could control the conditions of ripening, than permit it to be done in an erratic manner at the farm. Further, every up-to-date cheesemaker knows that by the use of pure culture starters he can control his acid fermentation much better than if he depended upon its natural development. The use of starters I am glad to say, is decidedly on the increase in Eastern Ontario, and I think that it is a good thing. But I would utter a word of warning in their use, and that is that they must be used judiciously, and not employed simply as a means to hurry through the day's work regardless of the necessity for their employment. These lactic ferment starters, which are simply pure growths of active lactic acid bacilli, are now prepared at the Dairy Schools at Guelph and at Kingston, and are furnished to makers for the cost of materials and mailing, i.e., 20 cents per bottle.

I have already very shortly touched upon the results of and the necessity for the presence of these lactic acid bacteria in milk when it is to be manufactured into butter or cheese. When one follows the course of events bacteriologically in cheese manufacture one notes a progressive rise in the number of these bacteria in the milk and then in the curd until the cheese goes into the curing-room, where after remaining a few days stationary we have a progressive decrease in their numbers, though they never seem to entirely die out even after two years. What part do they play? The acid which they form from the milk sugar has an important effect on firming and mellowing of the curd. I am not pratical cheesemaker enough to describe this quite properly. Further, there can be no doubt that the acid is important in the curing

process, and I cannot but think the old idea which has recently been revived by Russell and Babcock of Wisconsin, that the rennet (or rather the pepsin ferment in the rennet) cures the cheese, has much to back it up. We know that rennet is an extract from the digestive part of the calves' stomach which contains the milk-curdling rennet and the digestive ferment pepsin. We further know that acidity is necessary for the proper action of this digestive ferment, and this is furnished by the lactic acid manufactured by the lactic acid bacteria.

So far we have been considering infection by a species of bacteria that are so commonly and constantly found that we must consider them to be practically natural to milk and its products. I now must direct attention to some other species which occasionally infect milk, and lead to more or less serious trouble in the process of manufacture, or in the cheese itself. With butter my experience is so limited that I will make no remarks.

Besides the pure lactic acid species there are a number of species which while they produce acid in the milk, also form gas and putrescent compounds--such species are the B. coli communis and its subvarieties, e.g., the B. lactis aerogenes. Both these varieties flourish well on milk and produce acid, but at the same time form gas and lead to putrescent changes in milk. The B. lactis aerogenes causes the milk to take on a very sour odor. These forms and related species are quite common in milk at all seasons of the year, but are particularly common in winter milk and during the hotter months of the year. They are common in winter milk because the sources of infection with such species are most common then. They are frequent in the hotter months of the year simply because if infection happens to occur then the temperature is so favorable for their development that they rapidly increase in numbers. In my experience contamination with these species is the most common milk infection after that of lactic acid bacteria. Where do these species come from? Both these forms are very common, the colon bacillus, constant in the manure of animals and fowls, so that in and around the farmyard we have always infecting sources. How do they get into the milk? There are several methods, and one or all of them may be present in any case. The manure dries and becomes broken up into dust to float around in the air and fall into the milk during milking, or into the milk can in the milk shed. This is a source of infection that in summer is seldom absent. In like manner the dust may arise from a neighboring hog pen, or from the road, and blow into uncovered cans. Then there is a great lack of cleanliness in milking. How many think of brushing off the cow's udder and sides thoroughly before milking—removing dust and any adhesive manure particles and loose hairs? If these are not brushed away they will gravitate naturally into the pail, and I have found that there is a close relationship between the bacterial cleanliness of milk and the cleanliness of the strainer. The cleaner the strainer the freer the milk is from contaminating bacteria, and where one finds a foul strainer one must expect (and seldom be disappointed) a bacterial contamination of the milk.

My experience of the last four months with the new milk supply company of Kingston warrants me in making this statement, and what is true of this dairy would apply much more decidedly to ordinary factories and creameries, for the company exercises a strict supervision over its milk supplies. Another common source of infection is the filthy habit of milking with wetted hands. Less could be said against this practice were the udder and teats of the cow thoroughly cleansed, but one knows how rarely this is done, and the consequence is that the washings of the teats and udder find a lodgment in the milk pail. It may be that one milks easier with a wetted teat, but one also milks in a less cleanly manner.

Lastly, we have as an infecting source the milk pails and cans. I pointed out before that seeding with the ordinary acid producing or souring species frequently came from this source, and so, too, does infection with these undesirable forms, as when milk pails used for the evening's milking are permitted to lie around the stable or milk shed to gather dust and be used without washing for the morning's milking. With milk cans the danger lies more particularly in those cans where very foul, perhaps

putrid whey, is brought in the cans. It is next to impossible to get rid of all trace of this foul matter from the cans, so that infection no doubt comes frequently from this source. When we add to these sources of contamination such subsidiary sources as a foul water supply at the farm and a careless washing in at least 20 per cent. of all cases, one will have exhausted the main sources of infection of the milk at the farm. Regarding the purity of the water supply of farms I can only call your attention to Prof. Shutt's summing up of his analysis of over 1,000 samples of farm well waters, when he reported that the majority were but diluted cesspools. In this particular I can record an instance that came under my own observation in September last. I drove out to the farm of a prominent dairyman some miles out of Kingston, and he called my attention to a mineral well he had quite near to his stable. I pumped out some of the water, and from the smell and taste came to the conclusion that the mineral was diluted "extract of stable." To confirm my opinion I had the sample analyzed and found my suspicions correct, so that I now have my own opinion of all mineral wells in or around stables or factories.

Last June I made a visit with Mr. Publow to a factory in his district, where they had been suffering from a bad flavor in their cheese. The factory and surroundings were in excellent shape, but the milk that came in was not, and I did not wonder at some of it not coming in as good as at night, for on our way to the factory we passed the houses of several of the patrons, whose milk stands were on the roadside some distance away, and we were enabled to see the methods employed for cleansing of cans. Water was brought down from the house and the wash clothes were hung on the fence, and seemed to have been on duty for some weeks at least. Out of curiosity I took away with me part of one wash cloth, and was not surprised when I developed from it quite a collection of gas-forming and putrescent organisms.

It does not quite come within the scope of this paper to cover the sources of bacterial infection at the factory, but I can sum them up by saying that improperly constructed factories leading to the accumulation of filth and a consequent multitude of flies in the factory itself, or around it, improper drains, foul whey tanks, and the contamination of the factory water are the chief infecting sources at the factory.

Now what are the results of the entrance of such species as the B. coli and its congeners into milk? Everything will depend upon whether the conditions are made favorable to their development and growth. If the favorable conditions are not present then there will be produced no tangible results. It is just like in an epidemic, many people may be exposed to the germs of infection, but the conditions are not favorable for the development of the bacteria in their bodies, so that they escape infection. The conditions that are favorable for their development are moderately high temperature, over 70 degrees, and a small number or an absence of the common acid-forming species. Given these conditions they may lead to very serious results, the severity depending on the freedom of their growth, or lack of control of their growth. Thus in curd we may find all stages of gas formation, from minute pinholes to foul floating curds. Sometimes there is not so much gas accumulation in the curds themselves, but the curds have a bad odor. Again, in the cheese, particularly if the curing temperature be high, we may find open cheese, though much more commonly owing to lack of milk sugar to ferment, we have the production of various grades of bad flavor, from a faint "off" flavor through various gradations, ending in the rancid stinking cheese. These then are the results of the entrance and growth of such species as the varieties of the colon bacillus, and as can be seen at once, they are undoubtedly the most important of the bacterial taints of cheese. There are a number of other rather important infections of milk, among which we have such conditions as fruity flavor and bitterness in cheese.

On the subject of bitter cheese I have nothing to offer, though I am pleased to see that Prof. Harrison of Guelph has worked this subject out.

On fruity flavors I have done some work, and I am inclined to place this flavor under a subheading with those produced by varieties of the colon bacillus. I do this

because in a specimen which I examined in September last for Mr. Publow I found a bacterium of the species in quite large numbers along with the ordinary lactic acid species. Mr. Publow brought forward the interesting fact that in this factory whey starters were being used, and with their discontinuance the trouble cleared up.

As Mr. Publow had brough me some of the whey used as a starter I was able to demonstrate the same species in it as in the cheese.

Mr. Ruddick informs me that he always fancied a resemblance between this flavor and that of old whey, so it seems possible that Mr. Publow has found the source of infection in this trouble, though it needs much more careful demonstration than has yet been effected.

On a number of occasions I have been asked if I had an explauation to offer for the yellowish to orange discoloration that at times is found on the ends of cheese in the curing-room. In some cases no doubt it is due to the kind of material used for the curing shelves, but in the majority of cases that have come to my notice this trouble is due to the action of the acid of the cheese (particularly in "wet" or "heated" cheese) on mould growth. The common blue or green mould, when exposed to the action of acid, turns yellowish or orange, as I can demonstrate to you in this tube. I record this because I am often asked about it, and by adding it to the paper it will reach many others who desire an explanation.

To sum up my paper, I may say that the propositions that must be laid down are: (a) That the entrance of certain pure lactic acid producing bacterial species is essential and necessary for the proper manufacture of cheddar cheese and ripening of cream, and that seeding with such species almost always is brought about naturally, and if not naturally seeded their place may be supplied by artificial cultures. (2) That seeding with species such as B. coli communis and B. lactis aerogenes is also common under the conditions in vogue on most farms, and it is, therefore, essential that we should take measures, first, to reduce the probabilities of the milk being so seeded, and, secondly, to prevent or check the development of any bacteria that have gone in. To do the first it is necessary simply to follow the general rules of cleanliness. To do the second we must depend upon proper aeratiou and cooling of the milk at the farm. The combination of cleanliness with proper care and cooling of the milk will lead to milk being delivered to the factory in superior condition for its manufacture into prime butter and cheese. I would commend to every dairyman and dairy worker here a careful perusal of the bulletins published by the Commissioner's Branch, Department of Agriculture, Ottawa, on the care of milk for cheese factories and for creameries.

I will also read to you the regulations which govern some of the large dairy companies in our cities, and you will see how far the average dairyman is from the ideal of the city dairyman who looks for a supply of milk of first quality for household use.

Regulations of Clarified Milk Co. of Kingston, Limited, for Guidance of Dairymen.

1. Milkers must clean their hands and persons thoroughly before milking.

2. The cattle must be rubbed free of dust, and if udder is dirty it must be washed with a damp sponge, which must be kept thoroughly clean.

3. Milkers are advised to milk without wetting the teats.

4. Milking is to be carried on in clean stables or sheds, free from dust, and milk is to be handled and preserved in a non-dusty place. Cattle must not be fed with dusty food before milking.

5. The milk must be aerated and cooled as rapidly as possible after coming from the cow. The milk must be cooled and preserved at a temperature between 50 and 55 degrees F. until delivered to the Company. All milk must test 3.5 per cent. butter fat.

6. All milk must be carefully strained through several layers of cheese cloth or coarse cotton. The strainer cloth must be washed and boiled after each milking

7. The milk pails and utensils employed must be in good condition and properly washed and scalded before using.

The cans (furnished clean) must be rinsed with clean cold water before milk is placed in them.

8. Stables and cattle are to be kept in a clean and sanitary condition, and are to be subject to any regulations instituted by any Legislature, Council, Board of Health, or by any other body having jurisdiction in the matter, and are subject to inspection by the company's officials and veterinary surgeon at all reasonable times.

9. The feed of the cattle must be carefully regulated so as to cause no taint in the milk.

10. No milk is to be supplied from cans within five days after calving.

I may end by saying that regulations such as these are by no means too ideal. They are only what are essential and necessary nowadays to supply the public demand not only for the direct use of milk as a food, but for its use in the making of the best article of buttter and cheese.

Mr. Green: What would be the action of this frulty flavor on milk?

Dr. Connell: We frequently meet with a condition where the milk will curdle without souring, and from it we often separate the bacillus commonly found in hay dust, and known as the hay bacillus. This appears to curdle the milk without souring it. It is a sort of sweet curdling—a sort of sweetish flavor is given it. Why this bacteria from hay dust does not come in oftener I cannot tell. Perhaps the acid has some effect upon them.

Mr. Ruddick: There are many valuable hints and suggestions in Dr. Connell's address. If we all took them to heart there would be a great improvement in the quality of our cheese and butter. I would like to emphasize the point he has made regarding the cooling of milk for dairy purposes. At the time of the introduction of aerating machines it was claimed that it was only necessary to let the milk pass through them once, and that any further cooling process was unnecessary. Now, I say as plainly as I can that in warm weather aerating alone is not sufficient. The mere act of aerating milk tends to hasten rather than to delay the process of fermentation if not done under cool conditions. It is therefore most important that the milk should be cooled in warm weather. It is only by so doing that a cheesemaker can control his milk in a proper manner. Too much milk is handled in an over-ripe condition.

Mr. A. Forster: Would you advocate coooling as well as aeration in cold weather? I have a vessel made with a perforated bottom, containing about two quarts. I plunge that down into the milk and when it is raised the milk streams through. Is it an advantage to aerate that two quarts at a time?

Dr. Connell: I would advise aeration at the temperature of the air; but the preservation of the milk depends entirely upon the cooling.

Mr. Ruddick: A good deal of injury is done to milk because the work of aeration is carried on in places where the atmosphere is not free from dust and odors. I believe that it is an injury instead of a benefit to aerate milk in the yard where the cows are milked. I thoroughly believe in the advantage of aerating milk, but it must be done in a place where the atmosphere is pure and wholesome.

The President: After this address of Dr. Connell's we must take more pains than ever to keep everything about the dairy sweet and clean. Let everything about the place be scrubbed. Begin with the hired girl. (Laughter.)

At this point the President announced that Prof. Dean, who had been attending the Vermont State Dairy Convention, was on the Imperial Limited express train on his way from Montreal, and had asked the President to try and have the train stop at Whitby, as a special favor. The President had wired Superintendent McGuigan to that effect, and had received a reply stating that while it was the custom to refuse any requests of this sort, yet on account of the importance of the work of the Association orders had been given to let the Professor off at Whitby.

"Not only the politicians, but the great corporations are coming to our aid," remarked the President, amid loud applause.

PERMANENT PASTURE AND HAY MIXTURES.

By Dr. James Fletcher, Botanist, Central Experimental Farm, Ottawa.

I am quite aware of the fact that some persons have succeeded in keeping fifty head of cattle on a hundred acres of land, and have not used pasture. But even Mr. Gould found it necessary, with his intensive method of farming, to have twelve acres of pasture. Farmers must have some grass growing for their stock.

We have had about 400 varieties of grasses grown and tested at the Central Experimental Farm, Ottawa. There are about 300 different kinds of grass growing wild in Canada, and some of these are very much more valuable than others for the farmer, and some are better suited for one locality than for another; and yet in the face of this we find that many farms have not yet learnt that some of these more excellent grasses can be grown by them. In fact notwithstanding the work that is being done at the experimental farms, we find that farmers are confining themselves almost entirely to timothy and clover. We receive many questions at Ottawa regarding hay mixtures, chiefly as to what is the proper proportion in which to mix timothy and clover for sowing, and the period when the cutting should take place in order to make the best hay. We fear that it is too often the case that the men who secure this information go back to the old system that their neighbors have been carrying on for years.

Now, regarding the timothy and clover mixture, the best results will be obtained by sowing twelve pounds of timothy to eight pounds of clover seed. We have found that mammoth red clover has a heavy crop at first, but will not do so well later. Another point in favor of the old common red clover is that while it has less stalk it has relatively more leaf, and yields a large aftermath. But it is usually in its best condition for cutting about the 18th to the 24th of June, while the timothy is not ready for a week later, and by using the mammoth red clover both it and the timothy will mature about the same time. It is important that the plants in the mixture should mature at the same time.

Mr. Gould: Is not the mammoth red clover a rather coarse, stalky sort of clover.

Dr. Fletcher: That is perfectly true; but at the same time it is an excellent food, and it is after all only a matter of comparison, which the stock do not appear to mind. We find that where it is grown it gives a heavier crop the first year than the common red, but not quite so much the second year.

It is most important that the hay should be cut at the proper time. We all know that the right time to cut ensilage corn is when the seed has formed, and it is getting to the glazing stage. It is then in the most nutritious condition, and there is not too much fibre. The proper time to cut grass for hay is at the period when it has made the greatest growth, and when the seeds have formed but are not sufficiently advanced to take up all the energy of the plant in maturing them. Do not let the crop get too far advanced before cutting.

In regard to the pasture mixtures at Ottawa, there are some which have had more success than others. We have had experiments going on with these mixtures for ten years. We have been trying to get a grass or hay that would give to the stock a nutritious food, with some variety about it, and a crop that it would repay the farmer to feed. Most of these pasture mixtures advertised by the seedsmen in their catalogues have been tried by us and we have practically rejected them all, and are now confining ourselves to the Guelph Agricultural College mixture and our own. There is not a wide difference between these two mixtures. The yield is about the same, and the price is about the same—perhaps there is the difference of a few cents in favor of the Ottawa combination. In fact they are very much the same, after all, and they give to the farmers of Canada an excellent pasture, which it will pay them to grow. With our mixture you can get two crops of hay, after which it can be put out to pasture for a few years. Our mixture for permanent pasture is as follows: 6 lbs. of timothy, 4 lbs.

meadow fescue, 2 lbs. orchard grass, 1 lb. Kentucky blue grass, 1 lb. mammoth red clover, 1 lb. common red clover, 2 lbs. alsike, 2 lbs. lucerne, 2 lbs. white Dutch clover, and on wet land 1 lb. of red top is added.

The Kentucky blue grass is really the same as our June grass. I believe that June grass will grow in any part of Ontario except in the Arctic region. It is a native grass. You will have noticed it spreading along the road side; it has such a rich, green sward. This grass is to be used for the bottom of the pasture, as the other grasses are higher growing plants. Kentucky blue grass is particularly good for milch cows. It does not do well on low-lying land, however, and on such places I would advise you to grow red top. The red top I refer to is that low, feathery variety that flowers about the same time as June grass. It is bluish-green in color and will even grow out of the water. It should never be omitted from any pasture mixture.

Lucerne is a valuable clover, yet it is a little fastidious in regard to locality, and there are some districts where it does not appear to do well. I have seen places where the simple dividing line of the road made a wonderful difference in the appearance of two fields. It will not thrive on damp land. It is a clover that demands certain conditions, else it will not pay a man to grow it. If, however, it grows well with you, it is a most valuable plant, for it has all the advantages of a nitrogen gatherer, and it is also a splendid fodder for the stock. The Guelph mixture has rather more lucerne than ours, and for light deep soils it is perhaps the better mixture.

I would also recommend alsike, which will give you more than you will get from the common red clover, and I would not fail to add some white top, or what is called white clover. Some people say that white clover will salivate horses, but I do not think so. I know that it will make an excellent bottom for permanent pastures, and it adds greatly to the value of the mixture. Alsike is a low land clover, and it is not injured by the clover seed midge. However, it is not so easily saved as the other clovers.

Mr. Dewhurst: Would you recommend alsike as a food for dairy cows? Does it not add an undesirable flavor?

Dr. Fletcher: I have had that question asked at several conventions, and I think that it is not one that really needs to be considered. At London four or five years ago they had the matter fully threshed out, and at the end it was still undecided. There were about as many on the one side as on the other. Alsike will sometimes scour an animal when fed too fully at first; and while this condition lasts the milk may be flavored a little.

Mr. Sprung: My experience has gone to show that there was a serious injury to the flavor of milk by allowing the cows to feed on alsike. We had a number of cases of bad flavor in our factory, and in every instance it was traced to the alsike.

Mr. Forster: I have found objectionable flavors where cows were fed on common red clover. It lasts for a few days.

Dr. Fletcher: Just so; but you would not drop red clover on that account; nor can I see why you should drop alsike either. However, if the maker believes that alsike injures the flavor of milk he should advise against its use.

Orchard grass is one of the favorite grasses in Europe, and does well in Ireland. It is a very succulent, and is a wonderfully quick grower. It is not unusual for it to spring up two or three inches in a single night after a good rain in favorable weather. It is earlier than timothy, but does not give so large a yield. One drawback to this grass is that it is apt to grow in tussocks or clumps if thickly seeded, and cattle will not eat it so freely then, or when its gets older, and is apt to become dry and tough. Keep it well fed down.

I believe that the common red clover is the most profitable crop we have. It will give a staple crop wherever grown, year after year. It should be in every mixture for permanent pasture.

Meadow fescue also gave us good results. It gave a good crop of grass, and makes excellent hay. It should be in every mixture, and will do well on rich lands especially.

Smooth meadow grass, June grass, and Kentucky blue grass are practically one and the same grass. As I have before stated, this is one of the most nutritious grasses

that we have. This grass should be cut when in flower in order to get the best results. We have been despising this grass in the past, although it is a most valuable variety. The particular June grass I refer to is the flat-stemmed June grass. The stem does not turn white until late in the season.

Foul meadow grass is most suitable for low, swampy land. Although not usually recognized as an agricultural grass, it is worthy of a trial. The Indians value it for its fine, soft quality.

Awnless Brome grass is one that demands some attention. If the Dominion Experimental Farms have done nothing else but introduce that grass into the Northwest that one thing would justify their existence. It is a very coarse looking grass, but it has the power of developing itself on otherwise uninviting soil, and it is now being grown on thousands of acres of semi-arid land where otherwise nothing would be growing to-day. It has also the characteristic of holding its nutritive quality. When it throws out its seed stem it also sends out five or six supplementary stems. This grass may be left until the seed ripens, and owing to the richness of the seed remaining in it still be worth as much for fodder purposes as if cut earlier. It is not so well suited for Ontario, because it has an underground stem like quack grass, or scutch grass, as we often call it. But do not be afraid of even quack grass. Look at it, and see what it is. It runs a lot of roots under the ground ; but they are not very deep—about four inches. See that these are turned up so as to be on top. The plant drinks with its roots, and breathes with its leaves, and if you will keep the roots exposed to the air you will starve and smother the plants and get rid of them. Shallow plowing is best. I have a plot of Brome grass at the Experimental Farm that never spreads beyond the dividing line. I would not be afraid to grow quack grass. In fact it is a very good food for live stock. The trouble is that it is so greedy that it chokes itself out. Simply treat quack grass in the right way at the right time, and you can easily get rid of it. Do not plow too deep. Turn up the roots to the air. This is the best way to get rid of weeds of any kind.

The President : A friend of mine, an Irishman, told me that he pulled up quack grass with his hands and burned it, and that quack grass grew from the ashes. (Laughter.)

Dr. Fletcher : The best way is to starve it out. And even if you let it run its way it will choke itself out in a few years. However, Brome grass will give more trouble than quack grass. I find, though, that the people who object most to Brome grass are those who have never tried it. It is giving large stores of food for live stock in the Northwest and in the Territories where the native grasses have died out. It is producing four tons of cured hay under irrigation near Calgary. Mr. Peterson, Deputy Minister of Agriculture for the Northwest Territories, last year received $400 for the product of eight acres of Brome grass in seed and hay. You can therefore see how useful it is in that part of the country. Of course it is not so suitable for Ontario conditions.

Indian corn is one of the very best grasses—for it is a grass—that the farmer can pay attention to, for it will give an average yield of fifteen tons to the acre. But where corn cannot be grown to satisfaction some of the millets may be raised. If you want a cleaning crop you can wait right up to the middle of July, and then put in millet. Its seeds will germinate with the smallest amount of soil moisture, and will give you a good crop of hay. But millet is injurious to stock if allowed to get too old when cut or fed. The best time to cut millet for seed is just when the flower is dropping. It will make good feed, and it will clean the land.

A worn-out pasture does not mean that the land is used up, but it means that some of these free-growing grasses have developed so many roots that a change is necessary. Of the other 400 grasses grown in Canada there are many which have useful purposes, but which I have not time to name now. Some are suited for wet land, while others are better suited for high, dry soils.

A Member : What about red clover for the silo ?

Dr. Fletcher : Mr. Grisdale says that he has put red clover in the silo, and that it has given him more satisfaction than ever. For green fodder it will pay every man engaged in dairying to sow peas, oats and barley in the proportion of one bushel of each to the acre, as a protection against summer drouth.

CONDITIONS AFFECTING THE CURING OF CHEESE.

By Prof. Van Slyke, Geneva, N.Y.

During the past five years the subject of cheese-curing has been very extensively discussed in its practical relations. You have recognized the importance of this portion of the process of cheese-making, and your dairy leaders have contributed much to the solution of the problem on its practical side. Dr. Babcock and Dr. Russell have led in the study of the scientific side of the problem, ascertaining some of the changes produced in cheese under various conditions of curing.

For nearly three years we have been working on some phases of the cheese-curing problem at the New York Agricultural Experiment Station at Geneva. Without going into details, I would state that we have six separate curing rooms, in each of which the temperature can be held at practically any fixed degree desired, anywhere within a range of 50 degrees, between 40 and 90 degrees F.

Moisture is more difficult to control. We aim to keep this as nearly as possible at 75 per cent. of saturation, but variations of ten per cent. are liable to occur at times.

I have not come here for the purpose of giving you any new practical information in regard to methods of controlling temperature and moisture in curing rooms. As a matter of fact, you Canadian cheese-makers are far ahead of those in New York in the extent to which you have made use of improved curing rooms, under the instruction and stimulation of Prof. Robertson, Prof. Dean, Mr. Ruddick, and others. I shall not touch at all upon the construction of cheese-curing rooms. My chief purpose is to present facts, which will, I hope, serve to emphasize the importance of giving attention to the conditions in cheese-curing rooms. I cannot promise you facts very different, in the main, from those previously known to you. Rather, I presume that the most of value that I can do is to furnish added facts, confirming results already secured. We have been able to work under conditions more completely under control, perhaps, than have others.

Now, I want to say at the outset that I am not a cheesemaker, practical or otherwise. If I were told that I must choose between making a cheese and being shot I should try to make the cheese. If I succeeded in making something really good, no one could be more surprised and pleased than myself ; but I fear that if I were to make a cheese under these conditions I should be shot anyway, and the product of my manufacture would probably be used for ammunition. I profess to be only a student of dairy chemistry, and more particularly cheese chemistry ; the results I have to lay before you are, therefore, more or less largely chemical results.

I shall consider with you the conditions affecting cheese-curing under three general heads :

1. Those affecting loss of weight.
2. Those affecting chemical changes in cheese.
3. Those affecting commercial quality.

In thus dividing the subject for presentation I would not be understood as implying that the conditions which influence the various changes indicated are distinct from one another. As a matter of fact, we shall see certain fundamental conditions underlying and affecting all the results we find in the ripened product.

Loss of Moisture in Cheese Curing.

The loss of weight in cheese during the process of curing under proper conditions may be regarded, for practical purposes, as being due entirely to the evaporation of water from the cheese. Of course the mechanical loss of fat by exudation from cheese, when the temperature is allowed to go too high, is a matter for serious consideration; but we are now assuming that such a condition should not be allowed to occur, and it will not, with a proper control of temperature. In my own observation, there is danger of some loss of fat even at 75 degrees F., provided this temperature is maintained steadily for some weeks. The loss increases rapidly above 80 degrees F. There may be a very slight loss in weight due to formation and escape of carbon dioxide or other gases from cheese, but these can be neglected for the purpose we have in view.

The rapidity and extent of loss of water in cheese-curing vary with several conditions, chief of which are the following:

1. The amount of water originally present in the cheese.
2. The temperature of the curing room.
3. The size and shape of the cheese.
4. The proportion of water-vapor present in the air of the curing room.

The results to which your attention will be called are based upon averages secured under the special conditions employed, these being temperatures of 55, 60, 65, 70, 75 and 80 degrees F., with a moisture content varying from 65 to 80 per cent. of saturation and averaging about 75 per cent.

For the sake of ready comprehension and comparison, the figures presented express results for 100 pounds of cheese, unless otherwise stated, and are given in round numbers.

The Amount and Rate of Loss of Moisture as Influenced by the Amount of Water Originally Present in the Cheese.

In the following table we show the amount of water present in the green cheese and amount lost per 100 pounds of cheese for each of four weeks, under uniform conditions of moisture and temperature:

Pounds water in 100 lbs. green cheese.	Pounds water lost by 100 lbs. cheese.			
	In 1 week.	In 2 weeks.	In 3 weeks.	In 4 weeks.
55	9.00	11.15	12 25	16.75
45	4.45	6.30	8.00	9.45
35	3.30	4.20	4.90	5.70

These figures show a general and marked tendency for very moist cheese to lose water more rapidly than cheese having less moisture, other conditions being uniform. The cheese having 55 per cent. of moisture at the start lost about three times as much each week as did cheese having 20 per cent. less water, and not quite twice as much as the cheese having 10 per cent. less of moisture at the start.

As the moist cheese loses water much more rapidly in proportion, the moisture in the different cheese tends to become more nearly alike; but, so far as our observations go, they would not all reach the same condition of water-content, except under very unusual conditions.

These cases are extreme, and may, perhaps, have no practical application in your experience, but there is a practical question in this connection to be considered later.

THE INFLUENCE OF TEMPERATURE UPON THE AMOUNT AND RATE OF LOSS OF MOISTURE IN CHEESE.

We will first look at some results which were obtained with cheese 15 inches in diameter, weighing about 65 lbs. when taken from the press and containing about 37 per cent. of water. This is the most common type of cheddar cheese made in New York, and I presume the same is true with you. The figures given represent the amount of water lost for 100 lbs. of cheese :

Temp. of curing room.	Pounds of water lost for 100 lbs. of cheese.						
	In 1 week.	In 2 weeks.	In 3 weeks.	In 4 weeks.	In 8 weeks.	In 12 weeks.	In 16 weeks.
°F.							
55	1.6	2.6	3.2	3.7	5.2	6.1	6.7
60	1.7	2.7	3.3	3.9	5.5	6.4	7.0
65	1.9	2.9	3.5	4.1	5.8	6.8	7.6
70	2.0	3.1	3.7	4.3	6.1	7.8	9.0
75	2.2	3.3	4.0	4.7	7.2	9.7	11.4
80	2.4	3.7	4.5	5.2	8.3	11.6	15.5

We notice the following points :

1st. The total loss of moisture is greater the first week, and also every following week at a temperature of 80 degrees than at lower temperatures. The loss increases with increase of temperature.

2nd. The average weekly loss or rate of loss increases with increase of temperature, as is shown by this table :

Temperature.	Average loss per week.				Total loss for 4 months.
	1st month.	2nd month.	3rd month.	4th month.	
°F.	ozs.	ozs.	ozs.	ozs.	lbs.
55	$14\frac{3}{4}$	6	$3\frac{1}{2}$	$2\frac{1}{2}$	6.7
60	$15\frac{1}{2}$	$6\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{1}{2}$	7.0
65	$16\frac{1}{2}$	$6\frac{3}{4}$	4	3	7.6
70	17	$7\frac{1}{4}$	6	$4\frac{3}{4}$	9.0
75	$18\frac{1}{4}$	10	10	$6\frac{3}{4}$	11.4
80	$20\frac{3}{4}$	$12\frac{1}{2}$	13	$15\frac{1}{2}$	15.5

The extra large loss at 75 and 80 degrees F. was caused by leakage of fat.

3d. The loss of weight is greater during the first than during any week following, being nearly as great as the total loss during the tow or three weeks following, all put together. This comparatively rapid loss of moisture during the first week is in part due to the fact that the bandage holds considerable water, and this quickly dries. Then, too, the outer surface of the cheese, in drying, begins to harden the pores of the cloth, also filling the pores to some extent, and this tends constantly more and more to diminish evaporation, provided cracking is prevented. Mainly, however, the rapid loss of moisture at the start is due to the fact that the moisture is highest then.

Influence of Size of Cheese Upon Loss of Moisture.

We present data showing the comparative losses of moisture in cheese of different diameters and of approximately equal height. To illustrate the point it is sufficient to present results with only two different temperatures :

Diameter of Cheese.	Temperature of curing room.	Pounds of water lost for 100 lbs. of cheese.						
		In 1 week.	In 2 weeks.	In 3 weeks.	In 4 weeks.	In 8 weeks.	In 12 weeks.	In 16 weeks.
Inches.	°F.							
15	55	1.6	2.6	3.2	3.7	5.2	6.1	6.7
11	55	2.1	3.6	4.2	4.6	6.4	7.4	8.8
7	55	2.2	3.6	4.3	5.1	7.2	8.8	9.8
15	70	2.0	3.1	3.7	4.3	6.0	7.8	9.0
11	70	2.5	4.2	4.7	5.2	7.4	8 8	10.3
7	70	2.9	4.5	5.5	6.2	8.9	10.9	12.2

In the following table we give the results found in case of cheese having the same diameter, but varying in height. The diameter was 7 inches in these cases. The cheeses were cured at the same temperature (60 degrees F.) :

Height of Cheese.	Pounds of water lost for 100 lbs. of cheese.							
	In 1 week.	In 2 weeks.	In 3 weeks.	In 4 weeks.	In 8 weeks.	In 12 weeks.	In 16 weeks.	In 20 weeks.
Inches.								
3	3.4	5.3	6.4	7.0	10.7	12.9	13.9	14.9
5	2.8	4.2	5.5	6.7	8.3	9.8	11.2	12.6
7	2.3	3.4	4.7	5 6	7.4	8.9	10.5	11.2

These results all go to show that increase in size of cheese is accompanied by relative decrease in loss of moisture during curing. We should expect this, because usually increase in size means diminution of outer surface exposed for evaporation relative to weight.

Influence of Moisture in Air Upon Loss of Moisture in Cheese.

The relative amount of moisture in air, or, more properly, the degree of saturation, probably exercises a more marked influence upon loss of water in cheese-curing than any other single factor. I will present a single illustration, representing two cheese, one cured in an atmosphere containing moisture equal to about 75 per cent. of saturation, and the other cured in an atmosphere completely staurated with moisture, the temperature in both cases being 60 degrees F.

	Pounds of water in 100 lbs. of cheese.					
	2 wks	1 mo.	2 mo.	6 mo.	12 mo.	15 mo.
75 per cent. saturation ..	36.00	35.2	34.9	31.9	26.3	24.9
Saturated	35.90	35.9	36.0	37.0	37.6	37.9

In the case of the cheese kept in a fairly moist atmosphere, the loss of moisture was considerable, amounting at the end of 15 months to about 11 lbs. per hundred pounds

of cheese. I the cheese kept in a saturated atmosphere there was a gradual absorption and actual increase of moisture. At the end of 15 months the moisture had increased 2 per cent. For every 100 pounds of green cheese we started with we had 102 pounds at the end of the experiment, the increase being due to absorption of water.

Some Practical Applications.

The results which have been thus far presented suggest some practical applications, to which your attention will now be briefly called.

1st. To the cheese-maker and the dairyman water is money when put in the right place in right quantities. It is essential, first, to put water into cheese in such proportions as may be best, and, second, to keep it there with the least possible loss.

The actual amount of water that cheese should contain hardly lies within the scope of my subject, but it may be of interest to state that in New York State the moisture in green cheese usually amounts to 36 to 37½ per cent. ; this is for regular cheddar cheese. For home-trade cheese, so called, made in the fall, the moisture more often lies between 38 and 40 per cent. It is safe to say that, for an average cheese-eater in the States, a moisture content of not less than 33 to 35 per cent. at the time of consumption is desirable.

From the dairyman's standpoint, it is desirable to sell as much water in cheese as will suit the consumer. Taking everything into consideration, I believe better results will be secured in quality by holding less moisture in the green cheese and curing it under such conditions that it will lose only a small amount of water, rather than by holding a larger amount of moisture in the green cheese and so curing that a larger amount of moisture is lost.

There are some cases in which cheese-makers plan to put 40 per cent. or more of moisture into the green cheese, in the expectation that 10 lbs. will be lost in curing. They probably have conditions such that their expectations are fully realized. I cannot believe that a product so made and cured will command much respect in the market.

2nd. The more completely a cheese dries the harder and thicker is the rind and the greater the loss to the consumer. Most people plan to throw away a rather thick rind. In a carefully cured cheese the rind is comparatively moist very near the surface, and only a very thin portion need be lost, and even this can be utilized in cooking.

3d. In preventing excessive loss of moisture, we have more water to sell at cheese prices. From inquiries made among our New York cheese factorymen, I find that under conditions more favorable than the average, the usual loss of weight during thirty days amounts to five pounds per 100 pounds of cheese. The amount is probably somewhat higher in the majority of our factories. In order to escape some of this loss, some factories try to get rid of their cheese when two or three weeks old. I believe this loss could easily be reduced by 1½ to 2½ lbs., and there could be for every 100 lbs. of cheese that much more water to sell at cheese prices. This would mean a gain of two to four hundred dollars a season for an average factory. While such saving may seem slight, it should not be treated with contempt.

4th. In making small cheese, like Young Americas, or thin cheese, like "flats," the proportion of loss is much greater, and hence the demand is still more imperative that these shall be cured under conditions where the loss of moisture shall be reduced to a minimum.

These statements do not apply in the case of small fancy kinds of soft cheese, because in curing them an essential part of the equipment consists of curing cellars of fairly low temperature and high moisture content.

Conditions Affecting Chemical Changes Taking Place in the Ripening of Cheese.

The change we have been considering, loss of water, is mechanical ; that is, it is not the result or cause of chemical change in anything. The water is in the cheese as

water, as part of a mixture ; it simply comes out as water in form of vapor. But from the moment a cheese is put in press, or even earlier, the rubbery, tough, insoluble casein begins to change into something else, or rather into a lot of other things, each of which is very different in character from the green-cheese casein.

We need not consider fat in this connection, as in ordinary cheese-ripening fat undergoes little or no change.

The profound changes seen in cheese-casein are brought about mainly, if not wholly, by certain chemical substances or ferments called enzymes. One of the striking characteristics of this class of ferments is that a small quantity accomplishes an immense amount of work. While enzymes are the product of living cells, they are not themselves living organisms, but simply chemical compounds without life, yet capable of producing changes in various materials.

So far as our present knowledge goes, there is reason to believe that the enzymes which cause cheese-casein to change or ripen come from three sources: (1st) Galactase, the enzyme in milk discovered by Babcock and Russell. (2nd) Enzymes produced by bacterial action in the udder, and (3rd) the pepsin contained in rennet. What proportion of the work is done by each kind of enzyme we cannot at present say. It is probable, however, that the pepsin of rennet plays a larger part than has previously been assigned it, as an investigation at our station, not yet completed, appears to indicate. Time does not permit me to dwell in any detail upon this feature, important and interesting as it is. Nor shall I tax your patience by any detailed consideration of the various kinds of nitrogen compounds into which cheese-casein is changed.

For the purpose of this occasion, we will consider only the general change from cheese casein insoluble in water into casein derived compounds soluble in water. These water-soluble compounds, made from casein, by enzyme action, are more readily digestible than the unchanged green-cheese casein. The exact relation between digestibility and water-solubility in the case of these specific substances has not been ascertained, so far as I know. But it is a matter of common and universal experience that well-cured cheese is more easily taken care of in the human stomach than is green or imperfectly cured cheese. It is fairly accurate to say that cheese-ripening consists of the breaking down of insoluble cheese-casein into soluble nitrogen compounds, because this is the chief kind of chemical change that occurs, and it is this change that so materially affects some of the most important commercial qualities of cheese. So far as we have any accurate available means for measuring the degree of cheese-ripening, the extent of change in cheese-casein affords the only satisfactory basis of such measurement.

And, at this point, I would refer to another important effect of cheese ripening, the development of flavor. Is this the result of bacterial action ? Or is it the result of enzyme action ? Is flavor formed as a part of the action by which cheese-casein is made soluble ? Or is it the result of some quite different action? Is flavor associated with the changes in fat-compounds, and in no way connected with casein changes ? So far as I know, these questions cannot be answered satisfactorily at present. We make use of flavor as a rough means, in part, of determining the degree of ripeness of cheese, more particularly from a market standpoint, but we cannot use it as an accurate basis by which to determine the extent of ripening with reference to changes in cheese-casein. The flavors of cheese are not mysterious, intangible ghosts; they are due to some special chemical compounds formed in the cheese, by enzyme or bacterial action; in other words, they are specific substances having taste and odor. They are formed after the cheese-casein has undergone some change. They are present in very minute quantities, and on this account are difficult to separate and identify, but before many years we shall know what they are, where they come from and under what conditions they are formed. Then we can hope to control them more effectually.

A variety of conditions appear to affect the rate of cheese ripening, among which we may mention the following : 1, Temperature ; 2, moisture ; 3, salt ; 4, rennet ; 5, acid.

Influence of Temperature Upon Cheese Ripening.

I will first call your attention to some 65-pound cheddar cheese, which were ripened at temperatures varying from 55 degrees to 80 degrees F. The figures in the table represent the number of pounds of nitrogen in soluble form for each hundred pounds of nitrogen present in the cheese:

Temp. of curing room	Pounds of soluble nitrogen formed for 100 lbs. of nitrogen in cheese.					
	In 1 mo.	In 3 mo.	In 6 mo.	In 9 mo.	In 12 mo.	In 18 mo.
° F.						
55	16.4	29.3	36.2	39.7	39.7	40 0
60	18.5	33.3	41.1	43.4	44.3	45.0
65	20.9	33.5	41.3	44.5	45.6	46 4
70	21.6	34.0	43.8	45.9	46.8	51 8
75	22.7	37.1	47.1	48 7	50 8	52.5
80	23.4	38 5	49 6	51 6	53.2	54 9

Your attention is directed to the following points of interest:

1. Cheese ripens more rapidly with increase of temperature.

2. Cheese ripens more rapidly in the early period of the process. For illustration, take the cheese at 65 degrees in the table. During the first month the average weekly amount of ripening was 5.2 per cent.; during the second and third months it was 1.6 per cent.; during the next three months it was 0.6 per cent., and it diminished steadily.

Why does cheese ripen so much more rapidly in the early stages? I can suggest only one explanation. The action of enzymes is weakened by the products of their own making. The soluble nitrogen compounds formed from casein by enzymes appear to have the power of checking or paralyzing the activity and affectiveness of the ferment. As these products accumulate in greater proportion, the rapidity of the ferment action slackens.

Influence of Moisture Upon the Ripening of Cheese.

For over two years we have been studying this question: Does the amount of moisture present in a cheese influence the rapidity of ripening, as measured by the formation of soluble compounds from cheese-casein? In order to control the moisture, we have employed two methods. First, we have covered the green cheese with melted paraffin, so that the loss of moisture was greatly reduced, and, as previously stated, we have kept cheese in an atmosphere saturated with moisture. We have made many such comparisons, and we find practically, without exception, that ripening proceeded more rapidly when the water contents of cheese was kept higher. For illustration, I will give you a single set of comparisons, in which we used three cheese, one cured on the shelf in the normal way, one covered with paraffin, and one kept in an atmosphere saturated with moisture:

	Per cent. water in cheese, in 15 mos.	Pounds of soluble nitrogen formed for 100 lbs. of nitrogen in cheese.				
		In 1 mo.	In 2 mo.	In 6 mo.	In 12 mo.	In 15 mo.
Normal	24.85	22.5	29.1	37.7	41.3	42.7
Covered with paraffine	28.10	23.3	29.4	41.8	44.9	48.1
Air sat'd with moisture	37.85	23.4	31.2	47.0	56.2	64.7

1. The three cheese had the same per cent. of water at the start, which was 36 per cent. These figures indicate that moisture in cheese is a very prominent factor in promoting the ripening of cheese.

2. Our extended study appears to justify the statement that, when the moisture in cheese drops to 30 per cent., the ripening process is greatly retarded, and that when the moisture drops below 25 per cent., the ripening practically ceases.

3. In general, we have found that any condition which retards the loss of moisture in cheese favors more rapid ripening, other conditions being the same. Thus, large cheese cure somewhat more quickly than small ones, as a rule.

This favorable action of increased moisture towards the ripening process of cheese may be explained on the general ground that enzyme action is promoted by moisture above a certain point. This favorable effect may come from the fact that the presence of the more abundant moisture prevents the concentration of enzyme products, the concentration of such products being unfavorable to continued enzyme action. It is also probable that moisture favors the growth of enzyme-forming bacteria in cheese.

Influence of Rennet Upon Cheese Ripening.

Rennet contains more or less of the well-known enzyme we call pepsin. Pepsin has the power of making cheese-casein soluble, especially in the presence of a small amount of acid. Babcock and Russell have shown that increased amounts of rennet in cheese-making increases the rapidity of the ripening process. Some work that we did several years ago pointed to such results, and more recent work confirms them.

We now have under way some investigation work for the purpose of showing to what extent rennet pepsin alone will ripen cheese. The work has not gone far enough to enable me to make any positive statement, but the indications are that some definite change is produced, and of some considerable extent.

In this connection it may be of interest to suggest that, in the use of starters in cheese-making for the purpose of developing lactic acid, we may be introducing an agent that favors the more rapid action of rennet-pepsin in cheese-ripening, because small amounts of this acid favor the action of pepsin. We have under way some specific work designed to show to what extent this is true.

Influence of Salt in Cheese Upon Cheese Ripening.

It has been known in a general way among cheesemakers that the excessive use of salt in cheese-making retards or prevents ripening. We have had under way some months work planned to show in a more exact manner to what extent the presence of salt retards ripening. I present a few results taken when the cheese was three months old, cured at 70 degrees F.:

Salt used per 100 lbs. milk.	Per cent. salt in cheese.	Per cent. water in cheese.	Soluble nitrogen.
.....	.....	37.2	46.5
1½ lbs.	.77	34.6	41.0
2½ "	1.15	33.2	38.4
5 "	1.62	31.9	34.5

Attention is called to the following points of interest:

1. The amount of moisture in cheese decreased with increase of salt.

2. The amount of soluble nitrogen, that is, the extent of ripening, decreased with increase of salt. The cheese containing no salt had ripened about one-fourth more than the cheese containing most salt.

3. The amount of salt retained in cheese was not proportional to the salt used. A larger proportion of the salt used was held in the cheese, when the smaller amounts of salt were used.

The amount of salt normally used in cheese appears to retard enzyme action, that is, cheese ripening. Salt does this, regardless of other conditions; but its action is emphasized, because increase of salt decreases moisture.

Conditions of Cheese-Curing Affecting Commercial Quality.

A practical cheese-maker may think at this point that the data thus far presented have a certain kind of interest, but he may be inclined to ask, like our politicians in the States, what there is in it for him, or where he comes in? In other words, what relation have the facts presented to the commercial quality or market value of cheese? How is commercial quality affected by increase or decrease of temperature and moisture? Is a rapid ripening of cheese something desirable?

As a basis for some specific statements, I wish to call your attention to some data secured at the Geneva Station over a year ago. The data, however, are simply confirmatory of those you have obtained here. The only difference is the range. The cheese used in this work were shipped to New York and scored by an expert, who knew nothing of the conditions of curing or what our station was after. The results are given in the subjoined table:

	Temp. cured.	Age of cheese when scored.				Total score at 5 mos.
		1 mo.	2 mo.	3 mo.	5 mo.	
	° F.					
Flavor	80	42	42	39	38	83
Texture	"	21	21	20	20	
Flavor	75	43	43	41	39	84
Texture	"	23	22	20	20	
Flavor	70	45	43	43	42	88
Texture	"	23	22	22	21	
Flavor	65	47	48	44	44	91
Texture	"	24	24	24	22	
Flavor	60	48	49	47	48	97
Texture	"	25	24	24	24	
Flavor	55	45	49	49	50	100
Texture	"	25	24	25	25	

We can summarize the results embodied in this table as follows:

1. The cheese cured at 80 degrees F. gave the lowest scoring every time, and showed steady decline from month to month, getting worse all the while, in both flavor and texture.

2. At the temperatures 80 degrees to 65 degrees inclusive the highest scoring in about every case was when the cheese was one month old. In each succeeding month there was falling off both in flavor and texture.

3. At 60 degrees F. the flavor remained fairly uniform during the whole five months, but the texture fell slightly.

4. At 55 degrees F. the cheese was not ripe enough in one month to score well in flavor, but improved from month to month, and in five months was perfect. The texture remained practically perfect from the start.

5. The rule is for cheese cured at temperatures above 65 degrees F. to acquire a more pronounced flavor, sooner or later becoming more or less sharp, and often developing flavors that are disagreeable and even offensive to cheese consumers. Cheese cured at lower temperatures acquire a mild flavor, improving steadily for months, and containing a uniform flavor for a comparatively long period of time.

6. The influence of temperature upon the texture of cheese is marked. Taking temperature by itself, where the moisture is kept practically constant, we find that higher temperatures tend to produce one or both of two results. In the first place it favors the formation of holes in the cheese; and, second, by the rapid breaking down of the cheese-casein, the cheese becomes rather soft, lacking in solidity of body. Under ordin-

ary conditions of curing, increase of temperature means greater loss of moisture. Marked loss in moisture tends to make cheese become crumbly and mealy to a greater or less extent, increasing with the age of the cheese. It is my judgment that an ordinary cheese will suffer in texture when the moisture drops below 30 per cent., and perhaps the limit is higher than this, often depending upon special conditions of manufacture. Even a cheese made from milk, to which cream had been added (the green cheese containing over 40 per cent. of fat), showed a crumbly texture when the moisture dropped below 30 per cent.

By way of summarizing the facts that have been presented, permit me to direct your attention to the following points:

1. High temperatures cause more rapid curing of cheese, but injure the quality.

(a) High temperatures increase loss of weight through increased evaporation of moisture.

(b) Excessive loss of moisture injures the texture of cheese.

(c) High temperatures and continued high moistures bring about more rapid ripening than with less moisture; but the texture tends to become weak and lacking in solidity, while flavors are produced that suggest putrefactive changes.

2. Low temperatures result in less rapid ripening of cheese, but favor the development of higher quality and longer keeping power.

(a) Low temperatures diminish loss of moisture, and hence loss of weight.

(b) Too little moisture, even at low temperatures, may result in imperfect texture.

(c) Higher moisture than average, even at low temperatures, favors more rapid ripening without impairing flavor or texture.

3. Whatever the moisture content of cheese may be, high temperatures can spoil the cheese; and the higher the moisture the more quickly is the spoiling apt to occur.

4. Even at a steady temperature of 70 degrees F. the quality of cheese is not maintained, compared with a curing temperature of 60 degrees or 55 degrees F., especially after the early stage of ripening.

During June, July and August the temperature in many curing-rooms will average 75 degrees F. or more, and how high it goes at times is limited only by the degree of heat outside and the capacity of the board to absorb and hold heat. Even where the difference of temperature varies so little as 10 or 15 degrees Fahrenheit, we may safely place the commercial difference at a cent a pound after the early stage of curing. This difference means ten dollars a day for every ten thousand pounds of milk made into cheese. Unfavorable climatic conditions are apt to prevail for two or three months at least, and when you have to heat curing-rooms with stoves in spring and fall an ideal condition of curing does not exist in respect either to temperature or moisture.

Higher curing temperatures mean greater loss of moisture, less water to sell at cheese prices, lower quality, less money and less cheese eaten.

5. With cheese cured at lower temperatures, the curing takes place more slowly, to be sure, but the cheese is growing better all the while, and acquires power of long keeping. This condition enables one to hold cheese for higher prices if desired.

I believe that this improvement in quality, made by curing cheese at low tepmeratures, will prove a most important factor in promoting the consumption of cheese.

We may try to persuade people that cheese is a most economical and concentrated form of food; we may talk to them about its digestibility; we may use every possible argument to prove to them that they ought to be more sensible and eat more cheese. But the average cheese eater, as far as I know him, does not want high-flavored, sharp-tasting cheese, and he stops eating it when he cannot find any other kind in the market. Give him a sufficiently moist cheese, well broken down, dissolving easily on the tongue, of mild flavor, and he will eat more, and you will be called upon to make more cheese of the same kind.

I am aware that there is a class of cheese-eaters who want very mild-flavored cheese, and think they can get it only by eating cheese very imperfectly or incompletely ripened. They will take it when three or four weeks old; and I suppose they will insist having cheese upon which they chew hard, that won't dissolve easily in the mouth or

stomach either. This kind of vitiated taste should be overcome, if possible, for it is eating this kind of cheese that has given so many people an exaggerated idea of the terrible demands made by cheese upon the digestive organs. In the long run this class of cheese eaters is hardly worth catering to, for even they are mortal, and they usually become confirmed dyspeptics and stop eating cheese altogether.

A paper on this subject would be seriously incomplete without reference to the results of the work of Dr. Babcock and Dr. Russell, announced about a year ago. Carrying on their investigation at temperatures well down below the freezing point, they found the ripening process successful in respect to quality, but the time required was long. Their work promises to furnish the ideal conditions for curing in respect to reducing the moisture losses and producing cheese of fine quality.

In conclusion, there are now before cheesemakers three general plans or propositions for furnishing proper conditions in respect to curing cheese.

1. One plan contemplates providing in each factory a suitable room where conditions of moisture can be fairly well controlled.

2. By another plan, cheese buyers take the cheese green from the factory and place them in suitable storage. The maker's responsibility ceases soon after he has taken the cheese from press, and the buyer assumes the problem of curing.

3. The third plan was proposed originally, I think, by Dr. Babcock and Dr. Russell some four or five years ago. It is to have buildings located centrally with reference to a number of factories, these buildings being especially erected and equipped for curing purposes. In this way one curing-house could care for the product of several different factories. Ideal conditions could unquestionably be secured by such a system.

We have seen that the problem of cheese-ripening largely centres about the two conditions of moisture and temperature.

DEVELOPING A DAIRY HERD.

By Prof. H. H. Dean, O. A. C., Guelph.

After some humorous opening remarks the speaker went on to say: I desire to call your attention to what has been accomplished at the Guelph Agricultural College in the way of bringing up the yield of the herd to a better standard than prevails ordinarily. The average yield of nineteen of our milch cows for the last year has been 8,114 pounds of milk, averaging 3.54 per cent. of fat, and giving an equivalent of 326 pounds of butter per cow. One cow gave as high as 11,379 pounds of milk, of 3.34 per cent. milk, or equal to 437 pounds of butter. Our herd of thirty cows all told have brought us in over $1,600 this past year aside from the value of the milk used for raising calves and for experimental purposes in the stable. Now, you will ask me, how have you raised the average yield of your cows over 8,000 pounds of milk? It is important to have good factories, and good makers, and good storehouses, and good ships for carrying our dairy products, but it is first and foremost important that we should have good cows. These cows must be well taken care of, and from these cows the best calves must be taken and carefully reared. I saw a number of cows on my journey between here and Cobourg to-day out in the fields looking for something to eat. They reminded me of the story of the mean old fellow across the line, who scrimped his wife all her life long, and continued his meanness even to the purchase of the tombstone intended to commemorate her virtues. When ordering the tombstone he ordered the narrowest slab that the owner of tombstones had in stock. On this slab he told the maker of monuments to place these words: "Susanna Hackett; Lord, she is thine." The slab was so narrow that the engraver was unable to get the last letter of the last word in the line. Consequently when people visited the graveyard the following Sunday, they saw over the grave of the departed, "Susanna

Hackett; Lord, she is thin." That is very much like some of the cows which I saw in the fields west of Port Hope on my way here to-day. There are too many cows like that all over this country. There is no profit in keeping cows unless they are properly fed.

The second great problem facing the dairymen of the country to-day is how to feed their cows so as to get the very best results. To-day this requires closer study than ever before, owing to the price of feed. We have been buying our own feed to a great extent, and the high prices have compelled us to buy carefully and after much planning. Oats were selling at 45 cents a bushel, peas 70 to 80 cents, and bran and shorts at $19 and $20 a ton. I found after looking up the chemical composition of these various foods that I could save about half a cent on each animal a day by feeding bran and shorts instead of oats and peas. Half a cent a day on each head means considerable where you have a herd of from twenty to thirty cows. Every dairyman must study the question of the nutritive value and the digestibility of the various foods he would give his cows. If he does not bring his intelligence to bear on this phase of his work he will assuredly come behind in the race.

Closely connected with this problem is the raising of the right kind of calves. I expect that in a few years we shall have our herd average 10,000 pounds of milk per cow, or about 400 pounds of butter. But in order to reach that standard we must rear our own heifer calves from the best cows, and train them so that they will turn their food into milk. For this branch of dairying—raising your own calves by a process of careful selection—you will have to receive your skimmilk in the best possible condition. There is nothing better for calves after they are three to four weeks old than skimmilk. After the calf is about six weeks old it is well to add bran and oats to their feed, also hay and roots. We conducted experiments during the past year at Guelph along this very line, reaching from July 4th till nearly the end of September, with six calves. In this experiment new milk was compared with skimmilk, oil cake, bran and oats. The calves ranged from two weeks old to five months, and were chiefly Holsteins and Holstein grades.

Two calves, four and five months old, gained 100 pounds in three weeks on skimmilk, bran and oats, at a cost of 1.87 cents per pound of gain. On skimmilk, bran and oats and oil cake they gained 91 pounds in three weeks, at a cost of $2.68, or 2.94 cents per pound of gain. This shows that the addition of oil cake, while it increased the cost of the ration, did not produce a corresponding increase in live weight. When a calf reaches six weeks or two months old I think that nothing will add to muscle and general weight like bran and oats.

Two other calves, six months and two and a half months old, respectively, were given skimmilk, bran and oats, and gained 73 pounds in three weeks, at a cost of $2.04, or 2.97 cents per pounds of gain. On skimmilk, bran and oats, and oil cake they gained 81 pounds in three weeks, at a cost of $2.68, or 3.31 cents per pound of gain. In this case also the cost per pound of gain was increased by the addition of oil cake.

A calf two weeks old at the beginning of the test was fed 14 pounds of new milk daily for three weeks at a cost of $2.35, or 6.71 cents per pound of gain. It gained 35 pounds in the three weeks. The milk was worth to us 80 cents per 100 pounds. When fed skimmilk, bran, oats and oil cake, it gained 45 pounds in three weeks, at a cost of $1 for feed, or 2.22 per pound of gain. Whole milk is too expensive for calves.

A six-weeks-old calf fed on skimmilk, bran, oats and oil cake, gained 43 pounds in three weeks, at a cost of $1, or 2.32 cents per pound of gain.

The above facts show that those farmers who are feeding whole milk to their calves are doing so at a tremendous cost, while those who will feed warm, sweet skimmilk, with bran and oats, will reduce the cost of a pound of gain by more than one-half. However, for the first three or four weeks of a calf's life it is necessary to feed whole milk in order to make a thrifty animal.

From what I have told you to-day, it will be seen that in order to have the best conditions existing in a herd it is necessary that the skimmilk must be returned in better condition than is usual, or else farmers will have to put in separators and keep the skimmilk at home. In our own creamery we pasteurize the whole milk before it goes into the separator. We run the skimmilk over a water cooler, and it is sent back to the farmers in the summer time cool, and in the winter time warm. We keep our creamery pipes and tanks as clean as we can. I hold that any creameryman who has his skimmilk tank in bad condition is not fit to carry on his business. (Applause.) Skimmilk is one of the most valuable foods that we can feed on the farm; it is good for nearly all classes of live stock. I have just come from the State of Vermont Dairy Convention, where this question has been thoroughly discussed. One shrewd dairyman there gave it as his firm opinion, based on experience, that at the present price of feed he would place the feeding value of good skimmilk at 40 cents a hundred pounds, and not to feed to his calves and pigs only, but to give to his dairy cows also. If creamery men will not send a better quality of skimmilk to their patrons they will most certainly lose their patronage.

In connection with the care of milk for cheese factories and creameries it is necessary that it should be cooled to 60 degrees if possible; certainly it should not be allowed to go over 70 degrees. The producer has this responsibility laid upon him. There is something more than aerating needed. In hot weather it is absolutely necessary to cool the milk. The idea that aeration alone is sufficient is false doctrine. A water cooler, an ice tank, or some means of cooling milk, must be adopted for summer conditions.

We have also been making some experiments in slight variations in the method of making cheese. We have been adding five ounces of rennet to the milk at a temperature of 82 degrees, and three and a third ounces of rennet at a temperature of 86 degrees, the object being to see if we could get an increased yield from the milk. The curd with the larger amount of rennet was cooked at 94 degrees, while the other was cooked at 98 degrees. We found that the use of more rennet and the cooking at the lower temperature, gave an increased yield of cheese, but there was too much acid by the ordinary curing, and the quality was inferior. However, as the increase in weight is equal to about a pound and a quarter of cheese per 1,000 pounds of milk used, and as the quality of the cheese when cured in cold storage was equal to that of the other make, the matter is worth further investigation. I find that over in Vermont they make a pound of cheese from nine pounds of milk. Of course, their cheese is not just like ours; and, besides, their milk is richer.

Regarding the practice of washing curds, advocated by some western makers, I would say that careful experiments made at the College Dairy during the year have shown that the practice should not become general. We found there that washing curds did not improve the quality of the cheese. In some cases we found that the washed curds scored a little higher, and in other cases the unwashed curds scored higher. As the loss in weight by washing averaged a pound for every hundred of curd it is manifest that the washing of curds should be the exception and not the rule. If indiscriminately done it is a pernicious practice.

We have also been making experiments to see if there was any difference in curing cheese in a dark room and in a light room. Briefly, we saw no difference in the quality of the cheese. Some men declare that you must have a light curing-room, but we could see no practical difference. An opinion is one thing, and an accurate fact is another thing. We have too many opinions and not enough accurate facts given us in this dairy business.

As Prof. Harcourt has told you, we have been making an experiment in curing cheese in cold storage. Let me just emphasize the fact that cold storage curing-rooms will prevent the development of some of these bad flavors we have been hearing so much about of late. The sooner the cheese are put into such cool rooms the better.

Over in the United States just now they are struggling with the Grout Bill, or the Oleomargarine Bill. At the present time dairymen are divided as to the amount of tax to place upon this butter imitation, although all are a unit upon taxing it heavily if colored and sold as butter. Let us be glad that we are not confronted with this problem, and that oleo in any form is not permitted to be sold in Canada.

We have yet to learn a good deal about the manufacture of cheese and butter. There are many lines that require close investigation. I believe there is need of a dozen men to just keep on investigating dairy matters in this country. We need half a dozen chemists and bacteriologists devoted to dairy investigation, and another half dozen practical makers and dairy students in the highest sense of the word.

PROBLEMS IN AGRICULTURE.

By C. C. James, Deputy Minister of Agriculture, Toronto.

We are standing in a dangerous position to-day. We have made great advancement, but there is a common belief that we have accomplished more than really has been accomplished. When a man comes to think he controls the situation he is in serious danger of sitting down and giving an opportunity to somebody else to step in ahead of him. That is just about our position at the present time.

We have too much at stake to continue in that attitude. Do you ever realize how important the agricultural industry of this Province is? The amount of money invested in this industry in Ontario is about one billion dollars.

Much greater progress has been made in the solution of problems in connection with manufacturing enterprises than has been made in connection with agriculture. Go into any of our great factories to-day and you will not find the piles of waste material which were formerly found there. What was once waste material is now turned into what are called by-products, and these products have become a means of revenue. It was recently shown, in connection with an investigation at Washington, that the beef from a steer killed in Chicago sells for less than the animal costs on the hoof. The profit in turning that steer into beef is all made out of the by-products

How is it in dairying and in agriculture generally? Has the same care been taken to avoid waste in these lines that is shown in manufacturing enterprises? I believe there is more waste in connection with agriculture to-day, even in the most progressive countries, than there is in connection with all manufacturing industries combined. How to make profit of what is now waste material in connection with agriculture is one of the greatest problems awaiting solution to-day.

Take the case of converting wood into paper. You see a pile of wood on the one hand, and on the other a pile of paper. There is not much difference between the material in the one case and in the other. But a great number of problems of the most intricate nature were solved before the work of changing the raw material in the form of wood into the finished product in the form of paper could be carried out.

Something similar is found in the case of wheat and flour. There are nearly the same materials in the one as in the other; but before wheat could be changed into flour by modern processes there were innumerable problems to be solved.

Take a handful of soil and a handful of wheat. These are entirely different in one respect, and yet the one was produced by the other. What problems are there not to be solved in connection with this transformation?

In the air of this room are all the elements which go to the making of a pound of butter. Is there anyone who can solve the problem of how this air is transferred into such a commodity? Yet that work is done, in dairying, by mysterious processes of which we know comparatively little. There is here one subject alone which should interest the most advanced experimenters which the world contains.

Problems of the Soil.

Are there not, too, problems connected with the soil? Why is one soil fertile and another not? There are very few soils so poor that they contain no plant food whatever. There are very few soils which, under favorable weather conditions, will not grow a crop of some kind. It is not alone the question of food in the soil, but how to make the food available for the nutriment of the plant. Human beings are particular as to the sort of food used for the nutrition of their bodies, and plants are equally particular in regard to this same matter. We know something of the use of ferments in preparing this plant food for the plant. We know the conditions under which these ferments will work; we know that the ground must be underdrained and that the air must get in. But the lesson is yet to be learned of how to make ordinary ground produce extraordinary crops.

Problems in Plant Growing.

Let me illustrate what may be done along this line. The average production of fall wheat in this Province in a good year is 20 to 25 bushels to the acre. On the experimental plots at the Agricultural College a yield of 40, 45, 50, and even 55 bushels to the acre has been obtained. In one case as high as 56 bushels were obtained. How was this obtained? By selecting every seed and putting it into the ground under the most favorable conditions. In some countries the yield is down to 7, 8, and 9 bushels to the acre. In the Old Country a better yield is obtained than is secured here. Is there no waste here? Are there not many problems to be solved before we shall make our fields give the maximum yield?

To Develop New Varieties.

There is something more than the matter of yield to be looked to. The fall wheat which gave the biggest yield at the College is objected to by the millers because they say it will not make the best flour. Here is another problem to be solved. We must get a wheat which will give us a large crop; which will mill readily; stand up well; which is not subject to rust, and will give us a good bread. There are five requirements which the ideal wheat should possess, and there is no variety to-day which possesses all these requirements.

If I could place on this table one handful of wheat having all the requirements I have just named, every grain of that wheat would be worth $1,000,000, because we could soon increase the supply, and, by growing this improved wheat all over Canada we would revolutionize our production in that line, and Canada could feed the world."

As we open up this question we find that there are problems upon problems to be solved; that, in fact, we have only begun to find out what these problems are. Very few plants produce their maximum to-day. Our fruits are standing waiting for the hand of the improver. In fact, the whole field of nature is open to him. Better field plants, better garden plants, and better production of the orchard are all called for. The man who can bring about improvement along all these lines will perform a service of untold value to mankind.

Problems in Animal Life.

It is not only in plant life that problems are waiting solution. Like problems are found in connection with animal life. In fact, the problems here are of a higher nature than in connection with plant production. We know that a cow can, by her mysterious mechanism, transform oats, bran, and hay into milk—but we are almost entirely ignorant of the methods by which this transformation is brought about.

Our people have not even acquired the lesson of how to produce the most from the cow. The average milk product of the cows of Ontario is 4,000 lbs. per annum. There are 900,000 cows on the farms of Ontario. If we could increase the average produc-

tion of these cows by even 3,000 lbs., and that is easily within range of possibility, just see what an enormous increase it would be to the wealth of Ontario.

See how much has already been gained by the solution of problems along similar lines. You remember the old-fashioned hog in which there was the maximum of fat and the minimum of lean. If we were raising a like kind of hog to-day we could not sell a single pound of our bacon in the English market. But by changing that hog into the bacon type we have within ten years built up an export trade in bacon which amounted to nearly $12,000,000 in the fiscal year of 1901. But for the dairy cow and the bacon hog there would not have been so much money to spend last Christmas in this Province.

Let me give you a few figures to show what the animal products of Ontario and of Canada amount to.

The hog products of Ontario farms increased from $8,776,000 in 1892 to $15,801,000 in 1900.

The exports of bacon from Canada were as follows :—

1894	27,000,000 lbs	1898	77,000,000 lbs.
1895	38,000,000 "	1899	112,000,000 "
1896	47,000,000 "	1900	132,000,000 "
1897	60,000,000 "	1901	103,000,000 "

Exports of Canadian animal products (beef, mutton, bacon, butter, cheese, etc.) :

	1871.	1901.
Meats	$1,912,062	$13,690,904
Butter	3,065,234	3,295,663
Cheese	1,109,906	20,696,951
Eggs	424,033	1,691,640
Total	$6,511,235	$39,375,158

Transportation and Preservation Problems.

There is not only the matter of production, but there is the matter of transportation as well. The transportation problem was a simple one when it consisted largely in floating timber down the rivers to the sea, or in shipping wheat. Something better was demanded when we began shipping live stock. A very different problem confronts us to-day when we are producing a fine quality of perishable fruits, dairy products, etc. How to preserve these products during transit, and to land them in the ultimate market in the best possible condition is one of the greatest problems receiving careful attention in connection with modern agriculture.

A Man Wanted.

If I could put my hand on a man who was willing to apply millions to the improvement of the condition of his fellows, I would have him establish the greatest agricultural laboratories in the world, man these with the ablest experts procurable, set them to work upon these problems regardless of their immediate practical application, and I feel sure that every dollar so spent would be returned tenfold to the people of this country.

The greatest man that France produced was not Napoleon, who broke down and destroyed so much, but Pasteur, who built up so much, a man who worked out in his laboratory problems that have blessed mankind, and have added untold wealth not only to France but to every other civilized country. There is work for a dozen Pasteurs in Canada in this great and fascinating field of agricultural science.

SCIENTIFIC TRAINING.

By Prof. H. H. Dean, O.A.C., Guelph.

I am delighted to see so many ladies here to-night. I would have shaken my head if I had been told that so many women would be found in Ontario County at a dairy meeting. It is one of the signs of the times. It shows that women have something more in view than the one idea of marriage, as has so often been charged against them. At the Vermont Dairy Convention the ladies had an auxiliary or branch convention, and they managed it well. At the banquet there last night a lady responded to one of the toasts, and she made an excellent speech. The farmers' wives and daughters of this country are waking up to the fact that there is a great work for them to do in connection with dairying—that there is much of relief and progress for them in the new methods that are being introduced in this great business.

Last Monday morning I gave a lecture to my Dairy School class under the following heads: 1, The man; 2, the cow; 3, the food; 4, the manufacture. I asked the class which of these four walls they considered to be most important in the dairy building. Some of them said, "The front wall." But I asked them what would happen if they built a good front wall and paid little or no attention to the others. You will readily see that if no proper care was given to the whole plan, and only to one wall, the building would fall to pieces in a short time. We should build the trench before erecting the building, and the trench of the dairy business is preparation. No one should expect to succeed in this business without preparing and fitting for it, and if we are going to build a good, strong wall we should have not only well selected stone but also good mortar. I asked my class "What is mortar made of?" They told me it was composed of lime, sand and water. I then said that the mortar needed for the dairy wall was honesty (lime), grit and determination (sand), and good nature (water). The man who is sullen and sour in his temper will never make a success of dairying. With this mortar of honesty, grit and good nature then, let us lay the foundation of the dairy business.

We should give more attention to the dairy man than we have done in the past. He should have knowledge, for knowledge is power in the dairy business as well as in everything else. He must also have kindness and cleanliness. The men who are preparing themselves for rearing this dairy structure in Canada must possess these qualities without fail. It has been said that any fool can farm. That is not true. It takes more brains, skill and application to-day to make a successful farmer than it ever did, and more than it does to make a success of any other calling in life. Edison says that genius has one per cent. of inspiration and ninety-nine per cent. perspiration, and that is about the ratio for success in agriculture. Too many of the young people of this country are afraid to work and get their hands dirty. Booker Washington says that one of the greatest difficulties he finds in connection with negro education at Tuskegee is that the pupils there—some of them children of slaves—consider it a disgrace to do manual work.

It has been said that we are altogether too backward in speaking of the work done at the Ontario Agricultural College My firm conviction is that there is nothing in Canada to-day that has moulded the agricultural thought and practice of the country to the same extent as that institution has done. And the farmers are coming to the conclusion that the College is a benefit to them as well as to the individual students. The farmers of Ontario can get the benefits of its laboratories and all its experimental work, and they can have it so strengthened and developed that it will be a veritable agricultural university. We are going to have it, too. Last year the Massey estate donated $40,000 towards building a hall and library for the Agricultural College, and now Sir William McDonald has given $125,000 to erect two buildings, one for the training of teachers who will go out and teach boys and girls how to do work, and the other for the benefit of women. Any system of education that overlooks the

teaching and training of women of the farm is deficient, no matter what other features it may have. Any man who would succeed in agriculture to-day must have a scientific training. I am glad to hear that in the Maritime Provinces they are talking of building an Agricultural College.

We are giving attention not only to the dairy man but also to the dairy cow, and also to the dairy feed. Other speakers are dealing more fully with these points. One of the things that struck me in connection with my visit to the Vermont Dairy Convention was to find that they are going largely into private dairying. Old dairymen are putting in separators, and are making butter at home for the sake of keeping the skimmilk for the calves and other stock.

Dr. Fletcher, of the Experimental Farm, Ottawa, gave an interesting address on "Flowers," in which he offered some valuable hints regarding the potting and care of window plants, and the selection and treatment of bedding out plants.

Mr. G. C. Creelman, Superintendent of Farmers' Institutes, also delivered a short address, in the course of which he said: In our institute work we are trying to get close to the man who is breeding and feeding the dairy cow, and I hope all concerned will get still closer together. There should be more intercourse and more confidence between makers, patrons, owners, and buyers. Makers in cheese and butter factories should take more pains to instruct patrons regarding what seems to them to be the very intricate work of dairying. Of course, that would take up some time, but it will pay. The farmer has to do most of his learning through his eye. A professional man, a lawyer, for instance, will get most of his information out of books, he will read up precedents and all that; but the farmer gets his knowledge largely by what he sees. To him the cheesemaker is a man who is conducting a very intricate process, and he wonders, "How can that man make the best of my milk?" If the maker is a gradnate of one of our dairy schools the farmer need have little fear on that score. The maker should help the farmer to understand things. He should take him into the factory, and explain the Babcock test to him. The average farmer thinks that the Babcock test is an invention of a Yankee doctor, Dan Derbyshire, and the devil. (Laughter.) He does not believe in the test, and is afraid that he is being cheated, and it is pretty hard to convince him to the contrary. But just show him all about it. The school teachers who are making the most success in their calling to-day are those who are introdncing what is known as Nature Study "on the side." They occasionally show the things that are around and about them to their pupils, and explain all about them. And so let makers of butter and cheese take their patrons into the factories and explain the processes and the machinery, and in that way they will get closer to each other, and finally solve the problem of making uniform butter and cheese.

ELECTION OF OFFICERS.

The report of the Committee on Nominations was read by Mr. Dargavel, and upon his motion, seconded by Mr. Whitton, was unanimously adopted. The list of officers will be found on page 4.

Mr. Derbyshire returned thanks to the members of the Association for re-electing him to the position of President. He was of opinion that the honor ought to go around, but he was pleased at this renewed expression of confidence. If he was wanted in any part of Eastern Ontario to give counsel or assistance he would be pleased to respond as far as was in his power. He paid a high tribute to the helpfulness of the directors and officers of the Association. He trusted that the coming year would be the most successful in the history of the organization.

REPORT OF INSTRUCTOR ZUFELT.

Last year saw the beginning of a new era in our work of instruction. This beginning, though, perhaps, imperfect in itself, nevertheless has proved to be a start in the right direction. In the turmoil and excitement of testing milk and prosecuting dishonest patrons, which formed the major portion of our work in previous years, we overlooked, or at least lost sight of, the evils which were slowly creeping in, threatening in time to seriously affect our reputation. But now that our system of giving instruction is being somewhat improved, we have had more time to investigate these evils and find out why it is we have not made the improvement we should.

Owing to a delay in making the final arrangements for instruction, it was well on towards the latter part of May before much actual work was done. From that on to the end of the season I was kept busy visiting the different factories in my district, giving instruction to the makers and addressing meetings of patrons where requested.

I visited in all 90 factories. Of this number 50 were visited regularly every three or four weeks, or as often as I could get around. The mere fact that the makers expected me to call on them at intervals acted as a stimulus to make them do their very best to have their cheese up to the mark, consequently it was not necessary for me to spend a full day with each, as the passing calls were quite sufficient to keep them on the right track; except in extreme cases where the maker was unable to cope with the difficulty. In such cases I took charge of the factory and made the cheese until the cause of the trouble was discovered. In one instance I had to spend a whole week at one factory before the source of trouble was finally located, but generally one or two days were sufficient.

Improvements in method of manufacture. Cheesemaking is becoming more and more an exact science and the elements of doubt are being gradually removed. The light of science is clearing up many a dark mystery and making possible that which previously appeared insurmountable.

Among some of the principal aids to cheesemaking lately inaugurated are the use of pure cultures, the fermentation test and the acidimeter. By the use of the pure culture we can to a large extent control the flavor of the cheese. The fermentation test is valuable inasmuch as it enables the makers to develop the predominating flavor of the different lots of milk, and if he is receiving any bad-flavored milk he need never be in doubt as to which particular patron is supplying it. By the use of the acidimeter we can with a greater degree of certainty keep a close watch on the development of the lactic acid from the time the milk is received until the curd is ready for the press. Every cheesemaker should see that his factory is equipped with an acidimeter and fermentation test and be supplied with a pure culture to be used as occasion demands.

The aim of this Association is, I believe, the elevation of the standard of quality of our dairy products. In order to do this more efficiently, all the factories should be brought under its supervision. In fact, there is a strong feeling in the country to-day that something of this nature be undertaken, and I believe the people will give their support to any scheme which has this in view. I would strongly urge upon our Government the necessity of making it possible for this Association to take up this work in a more thorough manner and to devote all their energies towards the improvement of our factories, the weeding out of incompetent makers, and the education of our farmers to produce better milk. Science has done all it can in pointing out our defects, and how to overcome them. It then rests with the people whether they will profit by this information; for unless we have better equipped factories, more skilled makers and a better milk supply, we need never expect to make any further improvement in the quality of our dairy products.

L. A. Zufelt.

Mr. Gallagher: Will Mr. Zufelt please explain about it taking a whole week to set a maker right?

Mr. Zufelt: The trouble was finally located to be due to the milk. It was a rather peculiar section of country. It was rocky, and the rocks dipped into the soil. The season had been wet, and had turned dry quickly. The rain had collected in these little hollows between the rocks and soured and decomposed on the land. The cows got these germs in their bodies, and they got into the milk. I never saw milk sour like that in the fermentation test. It took a pretty strong stomach to stand the stench we developed in that test. It took me a week, for the simple reason that I wanted to get the sample examined by the bacteriologist. I spent two days getting the sample for the examiner, and then I had to go back for a few days to verify matters. I put a sample of that milk in the factory over night, and also placed a sample in a farmer's house, and it was clearly shown that the fault was not in the factory. I traced it to the peculiar weather of the year that made these conditions prevail. The water, as I have said, became decomposed, and the cows travelling about got the germs on their bodies, and in the process of milking it was brushed into the milk. I believe that most of the defects that the cheesemaker has to contend with can be traced directly to the filthy manner in which the milk is treated while in the hands of the farmer.

Mr. Gallagher: I had considerable trouble with butter becoming mouldy. What caused that, and what will prevent it?

Dr. Connell: I had not an opportunity of examining Mr. Gallagher's creamery, although I did see the butter. It was the worst moulded butter I ever saw. It must have been either in the salt or from the creamery itself, or from some of the milk that had been brought in.

Mr. Zufelt: There is no necessity of making poor cheese. Educate the farmer to produce good milk, have the proper sort of factory for making it, and we will furnish you with a skilled maker. We have been trying to begin at the wrong end. If you wish to build a house you should start at the foundation. If you want to make first-class cheese you must begin with the patron, the man who produces the milk; then with the maker and his buildings and appliances, and finally with the curing and selling part of the business. The work of the Association should be along these lines. The work of our instructors should not be to educate the cheesemakers. We have Dairy Schools for that very purpose. You cannot train a cheesemaker in two or three days. The inspector's work should be a sort of guarantee to the patrons that they are being served by the best kind of men. If the maker is not a fit man the inspector should report him to the patrons, and urge them to replace him with a more competent man. The farmers are the ones who are the losers by bad management of a factory, and they should be given counsel. The buyers will always look out for themselves. The farmers have their money invested in this business, and it is to their interest to see that the work is properly done, on the farm and also in the factory. I repeat that we must pay more attention to the first stages of the production—to the care of the milk, the construction of factories and the weeding out of inferior makers.

REPORT OF INSTRUCTOR PUBLOW.

I have the honor of submitting my fourteenth annual report as instructor for the Eastern Dairymen's Association.

Owing to the progressive change inaugurated this year in the system of giving instruction I was enabled to do more and I trust better work towards the improvement of the quality of the cheese in my district. In previous years my time was too much occupied in testing milk for me to devote as much attention as I would have liked to work of this kind. This year, however, I was enabled to visit regularly all the factories operated by members of this Association, and in making cheese and addressing patrons on the care of milk when requested.

I succeeded in visiting 150 factories, giving them 231 calls. Of this number 79 applied for instruction. 50 of these received one full day, and 20 two days each, with a talk to the patrons on the care of milk the evening of the second day.

The quality of the cheese turned out during the months of May and June was, if anything, superior to that of previous years, but for the months of July and August there were a lot of inferior quality, the defects being bad flavor, weak body, open texture and acid cut.

Condition of Factories. Of the 150 that I visited 25 had provided means for controlling the temperature of the curing-rooms during the hot weather. The means used in two of these was sub-earth air ducts and in 23 by means of ice on racks. I might say that I invariably found the cheese in these factories to be of good flavor and texture. The general condition of the factories might be classed as follows: 50 first class, 50 second class, 40 third class, and 10 utterly unfit to be considered as factories at all. The principal defects found in the factories were poorly-coustructed buildings, bad floors, leaking vats, poor presses, filthy underground whey tanks, bad water, bad drainage and filthy surroundings. In seven of these that were having bad-flavored cheese I traced the cause directly to the filthy condition of the factory and surroundings, and as soon as these were remedied the trouble ceased.

In summing up the sources of defects found in the cheese I find that they are about equally divided among poorly-constructed and equipped factories, incompetent makers and bad milk. Any work then which we do in the future should be towards the improvement of these conditions. In my opinion the most efficient way in which to accomplish this would be to organize the factories into combinations, with competent instructors in charge, whose duty would be the instructing of patrons in the best methods of producing, caring for and delivery of milk, and the necessity for having the factory which they patronize properly constructed and equipped, with a competent maker in charge; also to visit the factories regularly every two or three weeks to see that the makers were doing their duty. This would tend to the production of a more uniform quality of cheese, and make it possible for each combination to make a reputation for itself, which would aid very materially in enhancing the value of the product.

G. G. Publow.

The President: It is no light matter that ten cheese factories in one district are unsuitable for receiving milk. It is a lasting disgrace to Eastern Ontario. The visits and advice of our instructors are calculated to improve these matters. The makers deserve to be blamed for much of this state of affairs. If they are true to themselves they can easily force action by refusing to make in such unsuitable factories.

Mr. Echlin: I would like to know what sort of cheese were made in these fifty first-class factories? Is a factory first-class without some special arrangement for curing cheese?

Mr. Publow: About twenty-five had ice, sub-earth ducts, or some such means of controlling temperature. The other twenty-five had good buildings and clean surroundings, with good drainage, and nothing at all disagreeable about the factory. The utensils in all of these fifty were clean, and this, I consider, goes largely to make a first-class factory. You seldom find clean utensils in a poorly-built factory. We do not get bad-flavored cheese from factories where things are kept clean. This vile cheese comes from factories that it is a shame to continue in existence. They allowed the whey to fester on the floors. Cheese of that character at first looked well. They bore well and had a good body, but they soon got stinking. Any floor that is not kept clean, dry and sweet is unfit for a cheese factory. The cement floor is all right. I am willing to work even on a wooden floor. One of the factories I visited was in such a dirty condition I called a bee of the patrons and we all set to work and cleaned the place up. The drainage was improved, fresh earth was shovelled up around the building, and everything put in first-class shape. No milk was taken at the factory until after the place had been thoroughly cleaned.

The President: Cement floor is the best where you can get a man who will make it well. It is easier to keep clean than a wooden floor.

Mr. Echlin: What did the people of these ten bad factories say when you visited them?

Mr. Publow: In every instance I called the managers together and pointed out the defects, and I may say that in no instance did they hold the maker responsible. They were ashamed of themselves, and agreed not to dock the maker.

Mr. Forster: What proportion of cement floors are now being used? Could we make it compulsory for cement floors to be put in co-operative factories?

Mr. Publow: That is a big question, and I shall have to leave the answer of it to some other person. We took samples of milk in every case where bad flavors were suspected, and we went to the persons concerned and explained matters. In one instance I found the manure piled up back of the wall of the cow stable. In another case I found sawdust, and the cows stamping around it. The rest of them were milking in yards where they have done their milking for years, and the cans stood there over night. I found that the farmers were surprised when I told them that the injury came from the yard. They thought that the gas came from the milk. They were thunderstruck when I told them that the gas came from outside influences. Start at the very foundation—with the producer of the milk.

The President: The average factory to-day will ask for tenders for the making of cheese and butter at the lowest price. They seldom seem to consider the ability of the applicant. They seem willing to squeeze the blood out of the very body and soul if they can only get the big end of the bargain. (Applause.) But if they will get men who have had a dairy education such as that now furnished by our Dairy Schools, and will pay them well, it will help to build up the industry in that locality, and such makers also will help to educate the community.

Mr. Gould: I have the floors of my stables made of cement. I have them cleaned every day, and all the cow manure taken to the fields daily. You cannot find a pound of manure or straw in the barnyard. Everything goes to the field daily. Do makers in cheese and butter factories go around among their patrons to see if they are getting the best out of their cows, and if the stable and other premises are in the right condition to give the best quality of milk for manufacturing into dairy products? How in the world makers can make good butter or cheese from milk of cows in the condition I have seen them is a mystery to me. I have travelled for Farmers' Institutes three years. I went home once with a man who is an officer in an institute. He would not let me go to his stables until after supper. When I got there I soon knew why he didn't want me to go. (Laughter.)

The President: It is a fine sight to see those pretty girls milking in nice, clean stables or yards.

Mr. Forster: In our district you would have to go to the house to see the girls, for we men do all the milking. (Laughter and applause.)

REPORT OF INSPECTOR BENSLEY.

I have the pleasure of handing you my ninth annual report as instructor for this Association. The district allotted me was the same as in former years, the counties of Lennox, Addington and Frontenac. I visited 80 factories during the season, commencing work the 6th of May, and finishing the 28th of October, working in all 152 days. Of this time 130 days were spent giving instruction and testing milk; balance of time was spent in travelling, attending cheese boards, attending court and settling milk cases.

I am pleased to say the number of offenders as regards tampering with milk has decreased very materially in my section, there being only eleven samples found wrong out of 5,000 samples tested. After interviewing the parties to whom the milk be-

longed settlements were made with nine, two standing out, which made it necessary for me to prosecute, winning both cases. The amount received from factory men for my services was $400, fines $150, half of which comes to the Association, making a total of $475.

I found the makers, with few exceptions, doing very good work; some of them have great difficulties to contend with, such as dirty, bad-flavored milk; others, who have good milk and nicely-made cheese, have not a fit place to keep them in after they are made; no control of the temperature whatever, curing-room no better than a barn. It is useless for me to say what the results are where such conditions exist. Another difficulty they have to contend with is the shipping of the cheese too green. There were two instances in particular where the cheese was made on Saturday and shipped on the following Monday. I have warned salesmen repeatedly of the wrong they were doing, but nothing seems to be a warning to them. It is very much with the salesman selling cheese as it is with the patron sending milk—all we care about is to get it off our hands.

Now, in my opinion there is not a patron sending milk to a cheese factory today but knows perfectly well how to properly care for milk, but the great trouble is to get them to do it.

This report I have confined to the work actually done, but shall be pleased to give any further information.

G. H. Bensley.

REPORT OF INSTRUCTOR LOWERY.

I have the honor of presenting my fifth annual report as instructor for this Association. The district assigned me was Campbellford, Madoc, Stirling, and Lindsay sections. My work for the past year, as in previous years, was chiefly testing milk and instructing cheesemakers. I commenced work on May 1st and finished on November 11th, working in all 167 days for the Association. I visited officially 80 factories, nearly all receiving two visits and some three.

Out of these factories I found twenty-five samples of deteriorated milk. After investigation fourteen of these parties were fined, ranging from $10 to $50, the total of which amounted to $280. Six of them were settled by the managers of the factories and the other five gave satisfactory evidence to clear themselves. I am glad to state that the number of cases of deteriorated milk sent to factories is decreasing rapidly in the section I have covered for the last five years. This goes to show that in a few years we will have no trouble along this line, which is so unpleasant. The fewer the cases the more time we will have for instructing the cheesemaker and also the farmer who produces the raw material, for on more than one occasion this season I have returned the milk on account of the cans being actually filthy. It is impossible for the most skilful cheesemaker to make fine-flavored cheese from such milk.

The amount of money contributed by factory men for my services was $475, which, with the half of the above fines, makes a total to the Association of $615.

As my territory was changed this year I had the opportunity of inspecting the factories in Lindsay section, in Victoria county, and, although younger in the business, I find that a number of them have good buildings, well equipped for making cheese. Yet I am sorry to say that, as other sections, there is room for a vast improvement in a lot of them, especially their curing-rooms, but I find a gradual advancement in the improvement of factories throughout the whole territory. I was very much surprised when working in Lindsay section at the late arrival of milk at the factory, especially in the warm weather. I visited factories which had 75 patrons, where the first can of milk did not arrive until 8 o'clock. This gives the cheesemaker a very poor chance, for milk, with ordinary care, cannot possibly be in good condition coming in at such a late hour.

After all that has been said about cleanliness and the importance of it in manufacturing cheese or butter, I still find a few who do not take the advantage of it and go right on in that careless, indifferent way. These are the factories where we find the poorest quality of cheese.

It has been stated by good authority that we are losing ground in the English market in regard to the quality of our cheese. There have been several reasons given for this depreciation, but I think one good reason has been overlooked. As for who is to blame I canot say, whether it is the farmer or cheesemaker, but in this section I find that the cheesemakers are the most to blame for cutting prices so low that some of our best cheesemakers were forced to leave the business and seek other employment.

J. B. Lowery.

REPORT OF INSTRUCTOR HOWEY.

The district assigned to me was, as in former years, Prince Edward, part of East and West Hasting and part of Addington counties. I commenced work the 8th of May and finished November the 9th, working in all 152 days. Of this time 132 days were spent in visiting factories, giving instructions and testing milk. The balance of the time was spent in travelling, attending cheese boards, attending court and settling milk cases.

The number of factories visited was fifty-seven. Of these I found twenty-two patrons sending deteriorated milk: seventeen paid fines to the amount of $374.50; the remainder were settled by the officers of factories. The amount contributed by factory men was $331, which, with the amount of fines due the Association, makes a total of $518.25.

I might say in conclusion that only about one-third of the factories that I visited were suitable buildings for the manufacture of first-class cheese, and you are all aware the past season has been a grand one to locate these old structures, and many a poor cheesemaker has had to cough up with a heavy reclaimage. Why is it? Because they sign contracts to manufacture first-class cheese in these old structures. There are a lot of young cheesemakers who have not the ability or knowledge to manufacture first-class cheese in an up-to-date factory, let alone these old structures. But why do they get these contracts? Because they are the cheaper men. I am sure if this evil is not remedied it will be the ruination of our cheese industry.

Hugh Howey.

REPORT OF INSTRUCTOR PURVIS.

I herewith submit this, the ninth annual report of my work as instructor. Though my work was the same as in former years I devoted more attention to the instruction of the makers than usual, and though I tested milk in nearly all the factories I visited I also assisted the makers all I could.

I commenced work on the 4th day of May and quit on the 5th of November, during which time I worked 149 days, as follows: 136 in factories testing milk and instructing makers; I visited 83 different factories from one to four times; eight days were spent in travelling, and five I was detained on account of rain. I found less tampering with milk than ever before, only eight cases of fraud, which were all settled by me, showing that the dishonest patrons are developing a wholesome fear of the consequences. The amount of money contributed by the patrons and factory men in the form of fees for my services was $507; collected from patrons accused of tam-

pering with their milk, in settlement therefor, was $146, half of which went to the Association, making a total for the Association of $580. The season started out nicely, but there was considerable fault found with the quality of the summer cheese on account of the cheese having been made to cure too rapidly, and then shipping them out too soon after making, it being a common practice in some sections in my district to ship the cheese made on Wednesday on the following Monday. Indeed, they in the Alfred section beat that, as eleven (11) factories there ship every other Monday, and take the cheese made on Saturday out of the hoops and send them off, cleaning the shelves completely. Competition to see who can get the best average, resulting in leaving too much moisture in the cheese, is another cause of complaint, as it results in the cheese going off flavor if not cured at a very low temperature, conditions that do not obtain at the average factory. I find that where sufficient time is given to thoroughly cook the curd before the whey has to be removed the cheese are generally all right.

I visited 83 different factories, spending 136 days in them.

A. P. Purvis.

REPORT OF INSTRUCTOR WARD.

I have the honor of now presenting to you my fourth annual report as instructor and inspector for this Association for season 1901.

I commenced work on May 13th and finished on November 1st, spending in the employ of the Association 149 days, as follows: 143 days spent making cheese, testing milk aud instructing; 4 days attending cheese boards; and 2 days detained on account of rain. During this time I also made 97 call visits. The number of factories visited was 77. Of this number 59 were under my charge, and of these 59 factories, 20 pay by the per cent. of butter fat. In the factories in which I tested, 4,992 samples of milk passed through my hands, of which number 12 were found to be deteriorated; a large decrease from last year. I settled 4 of these cases, and the balance were dealt with by factory management.

The amount of money collected is as follows: From boards, $250; one-half of fines ($60), $30; total, $280.

In the section I have travelled over for three years I find a steady and decided improvement in the quality of milk delivered and cheese made. There are a few things besides the instructing and inspecting that have to do with this steady improvement in this section, and I think it will be well to bring them out here. They practically make no May or November cheese, return no whey in milk cans, sell their cheese every two weeks, and, last but not least, give their makers better pay than some sections.

There are a great many things which I might touch on in this report, but no doubt they will all be brought out in the discussion. But one thing I cannot let pass, for I know it is doing untold injury to the fine and good keeping qualities of our cheese; that is, over-ripening milk, using too much starter, and an improper starter. For an improvement in the quality of our cheese I do not think I can better end this report than by repeating the three statements which were made by Professor H. H. Dean at the western convention last year, if that gentleman will allow me to do so: 1st. The patron should supply the cheese factory with clean, cool milk. 2nd. The cheese factory shall be clean, with no rotten wooden floors, or wooden gutters. 3rd. The cheesemaker should understand how to use and prepare cultures and starters, and use them with judgment.

R. W. Ward.

REPORT OF INSTRUCTOR RABB.

I have the pleasure of presenting to you my second annual report as instructor and inspector of creameries for this Association. My work this year was the same as last, differing only in the amount done. I visited the creameries and gave instructions in the details of manufacturing. I am pleased to be able to say to you that I found the general condition of the factories, and the quality of the butter made, somewhat improved, but there is one feature of the business that is not altogether satisfactory. To make a number one article of butter we should have a better quality of milk. There is great need of improvement here, but it seems to be difficult to get the producers to put into practice what they have in theory.

It is a satisfaction to me to report that a large number of our winter creameries have again opened up, while a number of new ones have been started. Further than this, I believe the general sentiment of the patrons is gradually turning to the idea of a shorter cheesemaking term each year.

During the season I have tested about two thousand samples of milk, out of which I found seventeen had been tampered with. Upon these guilty ones I had the unpleasant task of imposing fines, ranging from $10.00 up to $50.00, which amount went to the general factory fund, of which they were patrons.

A. B. Rabb.

Mr. Woodward: Did the inspectors find many culls in the factories, and, if so, were these culls marked as a special brand before shipping?

Mr. Publow: We did find some culls. What was done with them would depend upon the honesty of the maker. Where the maker was honest and wise he would brand these culled cheese; but sometimes they slipped through. It is not because makers do not know enough to be honest and brand cheese; but a few fellows will try and sneak culls through, although they could not make a greater mistake. Every maker should be honest enough and wise enough to brand cheese, for the sake of his own reputation.

Mr. Whitton: Mr. Purvis ought to explain about those quick shipments of cheese. If they were made on Saturday and sent off on Monday they must have been cured on Sunday only. (Laughter.)

Mr. Purvis: In the section of country I cover they have no large factories. One of them may make six a day. In one case the teamsters went there and took the cheese out of the hoops in my presence. I made a kick about it, and they told me to see the salesman. These cheese were brought out for shipping, and were left on the platform for hours until the train came along. The salesman told me that after the cheese left they were put into cold storage at Montreal. He said that the Montreal men would see to that, and that they made allowance for shrinking in the weight.

The President: Then a patron who milks on Friday can have his money for the cheese on Monday? (Laughter.) But, speaking seriously, you have no idea of the number of people who are of the same mind as that salesman. If they can only dump their cheese on the platform, and get the receipt, they do not care what becomes of the consignment. If we will have a good reputation in our own neighborhood, and in the old country, we must do the decent thing all through this dairy business. The cheese must go in the best possible way, so that the man who buys them will have a good opinion of their quality. We have men in England who have been getting cheese from our firm for years, and they never think of asking about quality. They take that for granted, because we would never think of sending them bad cheese. It does not pay to handle poor goods. I do know that in one case we culled fifteen cheese, but we found that in the fall they had slipped in again. They had actually been sent to the old country, and had escaped the inspector at Montreal. That shows that even where closely guarded against some culls may be sneaked through. But that sort of thing never pays anybody concerned. In this particular transaction I had the facts and figures to prove the fraud. I

had a bill of $100 sent to that factory for the fifteen culls they had palmed off on us. I told them that if the affair was not settled on that basis I would put it in my solicitor's hands, and the money came. (Applause.) The man in the old country is likely to get it into his head that you do this thing knowingly, and you cannot afford to deceive them. If you think that it is possible to slide culls through and maintain the reputation of our cheese at the same time, you are badly mistaken. You must have better factory buildings. You must hire honest and skilful makers, who will be educators to their respective neighborhoods. Only the best article made will enable us to retain our British trade. We must have a pride in our business if we are to succeed. I am glad to be able to say that we have hundreds of factories that never made finer cheese than they did in 1901. They had no short weights, no poor broken boxes, and have given no trouble to the buyers on either side of the water. The trouble is with the fellows who try to run things on the cheap—cheap buildings, cheap boxes, cheap makers, cheap reputation. The man who does not want to go into the dairy business on a proper scale of efficiency in the size and style of the factory and the skill of the maker, should get out of it and keep out—as the saying is, "Go 'way back and sit down."

Mr. James: How will you prevent the shipping of this cheese?

The President: If you ship to me I can stop it in the third week. Make it so that he will handle his product right. Pay him a lower price than he would otherwise get. Make it uncomfortable for him to do wrong.

Mr. James: Will he not then sell it to someone else?

The President: That other man will soon get on to the fellow, and so his head is finally chopped off. I believe that we are going to remedy this thing. If any fellow tries to palm off any of this poor stuff on me, then the Lord have mercy on his soul! (Laughter and applause.)

Mr. Purvis: That business of early shipping seems to be growing. A few years ago the cheese was sent at a week. They put in the Monday cheese and got an increase of weight. Now a good many are shipping cheese made on Wednesday as early as the following Monday.

Mr. Dargavel: Is it not possible for instructors to lay this matter before the patrons? If the patrons really understood the iniquity of the business—the losses they were sustaining individually, and the losses to the country, through making this poor cheese and shipping it so early—would there not be an awakening right there? Let our instructors call the patrons together and tell them in such cases that the maker is trying to do impossible things in endeavoring to make first-class cheese in a factory that is unfit for the work. Let the matter be brought right home to the patrons. Also show the patrons that in many cases they are producing milk that is unfit for making good cheese. There are many troubles about this cheese business. In the first place, the cheesemaker is running in hot opposition to the neighboring factory, and on that account is taking milk of which fifty per cent. is unfit for cheesemaking. The manufacturers are afraid to say a word against their patrons for fear they will trot off to the next factory, where the maker will be only too glad to take the milk from his competitor. The patrons little think of the injury that they are doing to the trade in taking such poor care of their milk. They do not think that while they are getting rid of their inferior milk they are paying the penalty of getting a reduced price for the reduced quality of the cheese made from it. Let them be shown this as plainly as it can be told them. I would suggest that if the inspector visits any factory that, in his opinion, is not in a condition to make good cheese, he will at once call a meeting of the patrons, and make the facts clear to them. What is the use of us sending our inspectors, and paying them from year to year to instruct cheesemakers who have not the building or the appliances with which to make the best article? Tell the facts straight to the patrons. Encourage the erection of larger factories, and see that the patrons are taught their part in this great work.

Mr. Whitton: I am surprised to hear what Mr. Purvis has stated about those new cheese being shipped. They must have some strange buyers in the far eastern part of the Association limits. (Laughter.) When we buy our cheese in the Belleville region no

one thinks of shipping in any of these green cheese. We never think of shipping cheese under ten days old. In Peterborough they sell their cheese only once a fortnight, and it is sold on the board. They never sell any cheese less than ten, twelve, or fifteen days old. I call Peterborough the banner district. (Applause.)

The President: Do you pay the same price in the factory that you do on the Board?

Mr. Whitton: Yes; for No. 1 cheese. There is nothing more damaging than to have cheese sent out as green as that described by Mr. Purvis. Cheesemakers are also using too much starter, and inferior starter, causing the cheese to ripen too fast and go off flavor. We are not getting the proper cooking of our curd, but are making a mushy cheese—one that is too soft.

Mr. Free: I have a great deal of respect for some of the inspectors, especially for Mr. Zufelt and Mr. Publow. I believe that careful scrutiny as to fitness should be made before inspectors are sent out. Of course a man cannot make good cheese in every place. I would like to know what kind of brand is placed on this culled cheese. We make none in our section, around Cobourg and Brighton. I always tell the supply men to send me the best boxes they can furnish. I do find, however, that some of the boxes are too large. One cannot have cheese boxes too close fitting; keep them snug and tight. I think that too much stress has been laid upon the work of the cheesemaker. The average cheesemaker does try to improve things. I have given instruction to my patrons. Some of the milk a maker has to handle is unfit for cheesemaking. One year I got stuff that nearly killed me and my men, but we finally got things improved. The buyers should be fairer to the good makers, and not make them suffer on account of the doings of those other miserable fellows. I am a believer in the Babcock test if handled properly, but with a man who cannot handle it right it is an injury to the business. An oily-tongued cheesemaker can slick it over. I have a Babcock test, but I have never paid by it, because I see the unfairness of the principle. The prices that are now paid for the making of cheese in some places are such that a man cannot live by it, nor can such an underpaid man be expected to do proper work.

Mr. Publow: Regarding the cause of soft cheese, of which there has been so much complaint, I may say that it is largely traceable to the use of too much starter. Too much starter causes fast ripening; the cheese will be weak in texture, and be inclined to be better. Stop using so much starter. In fact I would advise you not to use any starter at all if you can get good results without it. A starter will be beneficial if the milk lacks acid for bringing about fermentation in the proper time, but not otherwise. Cheese cannot be made in such manner that they will be meaty and mellow in one week. You cannot ship green cheese and expect the best results. It is true that a softer cheese has been asked for—one that will break down more quickly. This cheese made with a hot of starter can be cooked quickly, and can be placed in the hands of the buyer early, and he may like the appearance of them at first, but they will not stand the test of time. I saw some of the cheese referred to to-day as having been shipped green. It was then six weeks old, and the holder of that cheese was disgusted with it, although it had been held in cold storage in Montreal. It was then a soft, pasty, bitter cheese. The cheese we want for consumption must be soft and mellow, and have a nutty flavor. Have them made firm before there is too much acid developed. Set the milk sweeter than you have been doing. Take more time in cooking, and expel the moisture sufficiently. Get proper body and texture. Use no starter if you can get good results without it. If you have tainted milk it is a benefit, but do not abuse its use. I would urge every maker to take a course at the Dairy Schools at Guelph, Strathroy or Kingston. Meetings such as this should not have the time taken up with instruction in making cheese and butter. Go to the Dairy Schools and be thoroughly fitted for your work. There should be an inspector and instructor for every combination of factories, so that he could inspect them every two or three weeks, and thus keep them in uniform condition. We have men in the Belleville and Brockville sections who are stamping their cheese, but I have never come across any branded as No. 2. I have often found second and third class cheese branded as first-class, however. Let the inspectors brand the cheese according to their real

class. We want to educate our patrons and makers so that our cheese will be such that the consumer will pay the best price for it.

Mr. Echlin: In speaking of never having seen a second-class brand put on, does Mr. Publow refer to the cheese or to the boxes?

Mr. Publow: I mean on the cheese.

Mr. Echlin: How does the maker know in the early stage of the work whether he should brand that cheese as first-class or not?

Mr. Publow: He can largely tell. The character of the curd is generally the character of the cheese.

Mr. Echlin: Stay right with it, and put a big brand on if you have to do it by lamp-light.

SILOS AND SILAGE.

At the request of several dairymen present Prof. Dean gave a five-minute address on growing corn and building silos. A dairyman, he stated, could grow more feed on an acre of land devoted to corn than he could by growing any other crop. From three to four times more digestible food can be produced with a corn crop than with hay on the same area of land.

Select a variety of corn which will yield a large crop of ears, stalks and leaves, and one which will mature in the locality before frost. Sow in drills or plant in hills—the latter if the land has many weeds, as horse cultivation may take the place of hand cultivation to keep the weeds in check.

If possible plow clover sod after haying, and work well on top for the remainder of the summer. Manure in the fall or during the winter. It is a good plan to ridge the field late in the fall, where practicable. In spring level the ridges, and cultivate well in order to prepare a good seed bed. Sow or plant the corn the latter part of May. Follow with shallow cultivation, especially during the latter part of the season, in order to retain the moisture in the soil for the corn plants and not cut off the feeding roots.

Cut the crop as soon as the ears are fairly well matured, and put into an air-tight silo. There are two requisites in making good corn silage: mature corn and an air-tight silo. Tramp the corn in firmly while the silo is being filled. Do not depend upon corn silage alone for feeding cows to produce milk, but clover hay and mix with the silage. Also give mangels and about eight pounds of meal for each pound of fat produced in the milk, or for every thirty pounds (3 gallons) of milk which the cow is giving.

The speaker recommended a cement silo for those who could afford the first expense. For men of limited means and for men living on rented farms the stave silo was a cheap means of providing suitable storage for corn. A bulletin on "The Stave Silo," published by the Department of Agriculture at Ottawa, should be in the hands of every dairyman who contemplates building a stave silo. The bulletin may be got for the asking.

The cement silo is much more durable, if properly built, than any form of wooden silo, hence is to be preferred on account of its durability. The first cost which approximates two dollars per ton capacity, prohibits its adoption by many farmers. Where a farmer really desires to lessen the cost of milk production he will be certain to erect some form of silo and grow corn to fill it. A cheap, square or oblong silo may be built in one corner of a barn out of studding 3" x 10", lined on the inside with one thickness of matched lumber. This form of silo will make good silage at a very low cost for the building, although it is better to have the silo separate from the barn or dairy stable, but closely connected with it.

A smaller silo filled with good corn silage for summer use is also a necessity on a dairy farm when the pasture becomes parched and animals are searching about the fields for something to eat. It does not pay to allow the cows to shrink in their milk flow early in the autumn for lack of suitable feed. About twenty pounds of corn silage daily and about four pounds of bran or chopped oats will assist very materially in keep-

ing up the milk flow at a season when milk, butter and cheese are frequently at the very best price.

Mr. Forster: In regard to the concrete silo, does the corn not dry out towards the edge? Does it not frost in very cold weather around the edge?

Prof. Dean: We do find at the College that there is some frosting, and that there is some spoiling around the edge; but take it all together, it gives the best satisfaction. The concrete silo is built to endure. Some silos have been built of stone, but I think cement makes the best silo; certainly it is better than stone.

A Member: Do you shred the corn?

Prof. Dean: No; we do not shred, although I think that is a good plan.

A Member: What about clover silage?

Prof. Dean: You do not get half as much out of clover as you will out of corn, if both are placed in the silo. Corn silage is the best for giving returns, acre for acre.

Mr. Gould: When I built my silo I had not the means of building a cement one, so I had to devise something cheaper. I conceived the idea that a tub of any kind, if hooped tight, would be successful. So I put the idea into practice, and built the first round silo in Canada. I find that you do not need to go to the trouble of bevelling the edges. Just get ordinary planks, fit them carefully, and you will be able to have a silo at a very low cost. I can build a wooden silo for the interest for ten years of the money it would take to build a cement one. There are twenty-two silos in sight of my farm. You can make just as good ensilage in a wooden silo as you can in a cement one. If a farmer is so shiftless that he cannot take a little time in the month of June or July to tighten his hoops up he is not fit to be a farmer. I have had ensilage frozen in my wooden silo. Under such circumstances I just leave it until the warm weather comes, and it is thawed down, and then give it to the cattle, and I get about as good results as I do from the unfrozen ensilage. What I am looking at is that I must make every dollar count, and if I can see that I can save a few dollars by the use of a wooden silo I am going to do so.

Mr. Sprung: We have a man in our section who feeds silage, and you can smell it off him when he sits in his pew at church on Sunday. (Laughter.)

A Member: What would you recommend for scouring in calves?

Prof. Dean: Put a little lime water into the milk, and keep the calf away from others for a while, as sometimes scouring is contagious.

BRITISH TRADE STATISTICS.

The following resolution was moved by Mr. J. R. Dargavel, seconded by Mr. Wm. Eager, and unanimously adopted:

"Resolved, (1) That the Eastern Ontario Dairymen's Association has learned with regret that the system practised by the department of the British Government having charge of the preparation of the Imperial Government returns as to Imports of agricultural products is such that agricultural products received at British ports are classified as imports from the country from which the same happen to be shipped instead of the country in which they were produced.

"(2) That in the opinion of this Association such a practice is most unjust to the agriculturists of this Dominion, as it makes the value and the amount of Canadian exports appear to be much less than they really are.

"(3) That this practice works greater injury to the dairymen of Ontario by crediting large quantities of our superior dairy products to the dairymen of the United States, and tends to lower the price of Canadian dairy products which are shipped from Canadian ports.

"(4) That the President and Secretary be instructed to prepare a memorial to the Minister of Agriculture for the Dominion requesting him to make strong representations as to the injustice resulting from this system, and to urge that the present system be so varied that the record of imports shall show in what countries the various agricultural imports were produced, instead of the countries from which they happen to be shipped."

AUDITORS' REPORT.

Statement of Receipts and Expenditures of P. R. Daly, Esq., Treasurer Dairymen's Association of Eastern Ontario, 1901 :

Receipts.		Expenditures.	
Cash on hand from last audit.	$ 1,350.52	Reporter	$ 100.00
Membership fees	211.00	Exp. Annual Convention, 1902..	613.75
Advertisements	215.00	Butter inspector, Mr. Rabb ...	250.00
Legislative grant	4,000.00	Printing	148.25
Prosecutions	505.25	Advisory Board, Kingston	230.00
Fees from factorymen	2,255.00	Advisory Board, Toronto	285.00
		Postage, telegrams and stationery	73.00
		Officers' salaries	190.00
		Local Committee, Belleville	109.00
		Industrial Exhibition	50.00
		Typewriter for Secretary	125.00
		Discount on cheques	2.75
		Law fees	17.00
		Acid for inspectors	20.00
		Com. arranging for Convention	40.00
		Hugh Howey, salary and exp'n's	760.00
		R. W. Ward, " " "	775.00
		J. B. Lowery, " " "	835.00
		G. H. Bensley, " " "	760.00
		G. G. Publow, " " "	1,000.00
		L. A. Zufelt, " " "	1,000.00
		A. P. Purvis, " " "	924.85
		Balance on hand	228.17
Total	$8,536.77	Total	$8,536.77

We, the undersigned, hereby certify that we have examined the accounts and vouchers of P. R. Daly, Esq., Treasurer Dairymen's Association of Eastern Ontario, and find them correct in accordance with above statement.

MORDEN BIRD,
F. W. BRENTON,
Auditors.

On motion of Morden Bird, seconded by F. W. Brenton, the report of the Auditors was received and adopted.

PASTEURIZING AS APPLIED TO BUTTERMAKING.

BY J. A. RUDDICK, CHIEF DAIRY DIVISION, OTTAWA.

Pasteurizing as applied to buttermaking, to use a somewhat trite expression, has long since passed the experimental stage. The laws of Denmark make the pasteurizing of all dairy products compulsory. Many of the leading creameries of Australia and New Zealand have adopted the practice. The Great Berry Central Factory of New South Wales, one of the best known creameries in the world, after a series of experiments, decided some time ago to make pasteurized butter. The New Euroa Factory in Victoria, another prominent institution, has also installed a complete plant for the same purpose. It has been proposed in both New South Wales and New Zealand to make pasteurizing compulsory, in the belief that such a course would be in the interest of the export trade in butter.

To come nearer home, we find that some of our very best and most successful creameries have adopted pasteurization with every satisfaction to themselves and to their customers. In view of these facts we can hardly afford to ignore the question, and it seems to me we should give more attention to it than we have done in the past, especially in connection with our winter buttermaking. There are, however, many who do not believe in pasteurization from the buttermaker's standpoint. Some hold that it is only a substitute for cleanliness, and that it would encourage carelessness in the

handling of milk, and thus prove a barrier to real progress in the direction of securing better milk. Others think the flavor of butter is injured by pasteurizing, claiming that the butter never has the fine, delicate aroma which unpasteurized butter may have.

As for the first contention, there is undoubtedly some truth in it, but it would be a great mistake to assume that when pasteurizing is followed the necessity for cleanliness in the handling of milk is lessened, even in the slightest degree. Moreover, as we shall see later on, pasteurization properly carried out goes a good deal further than to act merely as a corrective for the dirty or careless handling of milk. In regard to the matter of the flavor of pasteurized butter ; I think it must be admitted that when fresh made it may not have so high or so full a flavor as some butter which is non-pasteurized, but the crucial test for flavor in export butter should not be applied until the butter is two or three weeks old, because it is always that long before it reaches the consumer, or even the English market that handles it. At this stage the aroma, that fine, delicate flavor perceptible to the sense of smell, is gone from any butter, whether it is pasteurized or non-pasteurized. My experience in comparing samples of pasteurized and non-pasteurized butter, made from the same cream, is that the non-pasteurized has frequently scored the highest in flavor when fresh made, but only when the cream had been in what might be called nearly perfect condition. After keeping it a short time the relative positions have invariably changed, on account of the non-pasteurized butter deteriorating much more rapidly than the other, so that in the course of a week or so the pasteurized butter had the best flavor of the two.

The same thing may be said about washing butter, for it is a fact that butter will often have a better flavor for a day or two if it is not washed at all, and yet no one seems to argue that the washing of butter should be dispensed with, because we have learned conclusively that such treatment improves its keeping quality very much.

Saltless Butter. As there is likely to be an increased demand for saltless butter the question of pasteurization grows in importance to the buttermakers of Canada. Higher prices are being offered for this class of butter, but in order to be acceptable it must have a perfectly clean and milk flavor. A large proportion of our present output is unfit for being made up saltless on this account. The salt in butter acts as a mild preservative, and it also adds a flavor which has the effect of masking to some extent any inferior flavor which may be present.

Object of Pasteurizing. The object of pasteurizing is to restore the milk or cream to its normal condition as regards bacterial content by destroying those undesirable germs which get into it after it is drawn from the cow, and thus prepare the way for the buttermaker to control the flavor by introducing the right kind of fermentation through the medium of pure "cultures." It is true that proper precautions taken at the time of milking and in handling the milk afterwards would obviate the necessity for it to a certain extent, but in ordinary practice it is not possible to exclude from the milk all the injurious bacteria, and the argument that pasteurization is not advisable because the necessity for it may be avoided is like saying that straining the milk could be dispensed with if people would only take the necessary precautions.

Feed Flavors Eliminated. There is another and very important phase of the question which must not be overlooked, and it is the well-known fact that objectionable feed flavors are removed in part if not wholly by the process of heating, which causes them to vaporize very rapidly. I wish to qualify that statement to this extent, that I do not believe all feed flavors can be removed by pasteurizing, because otherwise it might be inferred that the persistent flavor of turnips could be got rid of in this way, which would not be correct. Finally, it must be admitted that the greater uniformity in flavor that would follow the general adoption of pasteurization would be of great value to the buttermaking industry by bettering our reputation for general excellence of product, and thus improve our position on the Old Country markets. The creamery system depends for its existence in no small measure upon this quality of uniformity, and Canadian buttermakers are somewhat handicapped in this respect owing to the comparatively small size of the creameries, so that anything which will tend to lessen this drawback should receive careful attention.

The Practical Application. Now, as regards the practical application of these principles, there is a good deal to be said. There are different ways of carrying out the work, and the choice of method will depend somewhat on circumstances, and on the particular object aimed at. When only the quality of the butter has to be considered, it is sufficient to pasteurize the cream after separation, but when it is also desired to lessen the danger of spreading disease by means of the skim milk the whole milk may be heated before separation. This plan increases the capacity of the cream separators fully one-third, as it is found that the cream separates from the milk more readily at the high temperature. An alternative plan is to separate at ordinary temperature and heat the cream and skim milk afterwards. For heating whole milk or cream a regular pasteurizing machine must be used. There are several styles now on the market, and those known as continuous pasteurizers are the best suited for the purpose. An elevating attachment is usually an advantage, and there should always be some device for regulating the inflow of milk or cream which makes it much easier to avoid variations of temperature. It is desirable that those parts of the machine coming in contact with the milk or cream should be made of tinned copper, not only for the sake of durability, but because copper conducts heat over five times as readily as steel or iron. For pasteurizing cream the temperature should be raised to 158 or 160 degrees, and as much higher as the cream will stand without taking on a permanent cooked flavor. Just what point that will be depends somewhat on the temperature of the cream as it enters the machine, and also upon the efficiency of the machine itself. I should not recommend a temperature for whole milk higher than 180 degrees F. in any case. It seems to be possible to raise the temperature of whole milk higher than cream without imparting to it any undesirable flavor, but the highest temperature recommended is 185 degrees F. This temperature, while it will not kill all the bacteria in milk, will destroy the most of the germs usually present. The disease-producing germs which are likely to be present, including the bacillus of tuberculosis, are said to be harmless after being heated to 185 degrees.

For ordinary creamery work, in warm weather, I am in favor of separating at ordinary temperatures, and pasteurizing the cream only. If the heating is done before separating, the skim milk should be cooled as well as the cream, and that is rather an expensive matter. There is no doubt that pasteurizing improves the keeping quality of skim milk, providing it is properly cooled, and if it is considered profitable to do so, there is no objection from a buttermaking standpoint. The heating should not cost much in any case, for the exhaust steam from the engine can be utilized for this purpose. In cold weather the cooling of the skim milk is a comparatively simple matter, because if it is run directly into the patrons' cans it is cooled quick enough for practical purposes. In dealing with the question of cooling, I want to emphasize the point that rapid cooling after heating is an essential part of pasteurizing cream, and it can only be effected by using a regular cream cooler. Cooling in a cream vat is altogether too slow a process. Even with the cooler, a large quantity of water or ice and water is required, the quantity, of course, depending on how low the cream is to be cooled, and the temperature of the water to be used. For the purpose of illustration, it will do to say that if cream has to be cooled from 158 to 62 degrees F. With water at 56 degrees, 5 to 6 pounds of water for every pound of cream will be required. If the water is colder of course a smaller quantity will do the same work.

If ice is available the quantity of water can be very much reduced, as one pound of ice is equivalent in cooling power to about ten pounds of water at 56 degrees for cooling cream from 158 degrees down to 62.

Cream or milk can be cooled to within about two degrees of the temperature of the water with proper appliances. After heating, the cream should be cooled quickly to a ripening temperature, and the pure culture added at once. Then when sufficient acidity has been developed, the cooling may be completed. For the first stage of cooling the cooler is indispensible, but for cooling after ripening a quantity of ice water in the space surrounding the cream vat will be sufficient, and, moreover, it is the only practicable way of doing it.

Every creamery should have a first-class cream cooler, even if pasteurization is not followed. The aeration of the cream passing aver a cooler as it comes from the separator is very beneficial to the flavor. All cream coolers should be constructed of tinned copper for the same reasons as apply to the pasteurizing machine.

Pasteurizing Ripened Cream. Cream which is only slightly sour, and has not reached the curdling stage, or that thick, syrup-like condition which all buttermakers are familiar with, cannot be successfully pasteurized. Curdling takes place under the influence of the heat, and there is an end to the pasteurizing. But when from 0.4 to 0.6 per cent. of acid is present, and the curdling stage has been passed, the cream will go through the machine and come out in a more fluid condition than when it went in. The results as far as we have gone in this work have been very satisfactory, but to give the matter a thorough test, the Department has procured several different styles pasteurizers, and a series of experiments are now being conducted at the Winter Creamery at Calgary, Alberta, the results of which will be published as soon as the information is available.

In view of the increase in the number of cream gathering creameries, this phase of pasteurizing is worthy of considerable attention.

That the adoption of the system has not always been successful goes without saying. There is too much involved to be no risk of failure. Sometimes we find those whose experience has been unsatisfactory condemning the system instead of placing the blame on the individual operators or imperfect machinery. It would be quite as reasonable to assume that creamery buttermaking is a failure because some creameries make very bad butter. The work must be carried out with intelligence, skill and good judgment if its possibilities are to be realized.

And now, in conclusion, I want to say that up to the present I have not been a very enthusiastic advocate of the general adoption of pasteurizing. I have studied the question to the best of my ability, have made some experiments, have noted the results as reported from other countries, and have had a great many opportunities of watching the effect on the product of particular creameries both in this country and in New Zealand, and the only conclusion I can arrive at is that it would be a good thing if all creameries adopted the system for export butter. I am not unmindful of the opposite views which are held by some men whose experience and position in the trade give weight of their opinions, but, looked at from all standpoints, the weight of evidence seems to be hopelessly against them.

MOISTURE AND SALT IN BUTTER.

By Prof. H. H. Dean, O.A.C., Guelph.

How much water should good butter contain ? is a question frequently asked. We quote from several authorities on this point. "Butter of the best quality, and possessing the best keeping properties, contains, as experience has shown, not less than 10 per cent. and not more than 15 per cent. of water." (Fleischman.)

"There is a general concensus of opinion among authorities that butter at the time of sale should not contain more than 16 per cent. of water. A high per cent. water does not appear to have any effect on the keeping quality of butter. Speaking broadly, butters containing 13½ per cent. water have the best flavor." (Richmond.)

Major Alvord, Chief of the Dairy Division at Washington, D.C., is quoted as saying last year at the National Buttermakers' Convention in the United States : "I should differ from my friend who just spoke in allowing 14 per cent. as the right standard. I should fix 12 per cent. as nearer right. There are some States in the Union, and some municipalities, which require 85 per cent. fat in butter. I hope there will be more."

In reply to a question regarding the amount of moisture in the butter which was shipped to England, Major Alvord said: "We have made it a rule not to send any butter abroad under the sanction of the United States Government that did not contain 85 per cent. fat, and that means 12 per cent. water or less."

Conditions Affecting Moisture in Butter.

I shall first quote from authorities, and then give the results of our own work.

"If the butter is churned at too high a temperature it will contain more water than at medium temperatures. Butter churned at very low temperatures also contains more water than at medium temperatures. Butter which is quickly churned has a tendency to contain more water than that churned slowly."

"If the temperatures for churning and working be too high a very large per cent. of water may be found."

"If after churning butter is divided into two parts, one being worked fresh and the other salted, the per cent. water is almost identical in the two samples. After standing, the salt butter will lose water, the fresh undergoes no such loss." (Richmond.)

"The way in which the washing is done, perceptibly affects the quality of the finished butter, particularly so far as regards texture and percentage of water."

"The smaller the granules of butter, and the colder the water used, the more water will remain in the butter without appearing in the form of drops." (Wing.)

"When butter from the same churning is divided and each portion is washed and worked in the same way, the salted butter holds less water than the unsalted."

In no case was there found so much water in the butter churned to small granules as that from large granules."

Large Granules.		Small Granules.	
Salt.....	2.52 per cent.	Salt..	2.69 per cent.
Water.....	13.98 per cent.	Water	12.15 per cent.

"It is to be expected that more water will be squeezed out of fine than out of coarse granular butter by a given amount of working." (Farrington.)

"The higher the temperature in churning, washing, or working, the less water in the butter. Warmer butter more easily parts with water." (Snyder.)

"Soft butter retains more water than hard butter." (Iowa Bulletin, No. 52.)

'Salted butter contained less water than the unsalted."

"The higher the salt content the less water the butter will contain." (Report Wisconsin Station.)

Prof. Farrington, of Wisconsin, reports that French butter "which appeared very dry" contained 15.1 per cent. moisture, and .4 per cent. salt. Good American butter which appeared to have much more moisture contained, on analysis, 12.4 per cent. moisture and 2.6 per cent. salt.

O. A. College Experiments.

These experiments began in 1897, when the average moisture in 48 samples made in the College Creamery was 11.034 per cent. Some samples, dried with a centrifuge that year, contained 9.4 per cent. water; while samples from the same churnings worked in the ordinary way contained an average of 10.1 per cent—nearly one per cent. more.

The moisture determinations for the years 1897, 1898, and 1900 were made in the Chemical Laboratory of the College. Samples were taken from numbered prints of butter from the different churnings. Some time usually elapsed between the churning and the sampling for moisture determinations. In 1901 the moisture and salt determination were made at the Dairy. Samples were taken immediately after the final working by cutting out a section of the butter weighing two to four ounces. This was melted slowly and thoroughly shaken. About three grams of the melted butter were placed in a shallow tin dish, about 2½ inches in diameter. The samples were dried from 8 to 10 hours, or to a constant weight, in a water oven.

The salt was determined by using a standard silver nitrate solution in which one cubic centimetre of the silver nitrate was equal to .005 grams of sodium chloride.

Butter salt contains 97 to 99 per cent. sodium chloride and one to three per cent. of impurities, hence the actual amount of salt contained in the butters would be slightly greater than the percentages given, owing to the impurities in the salt.

TABLE SHOWING RESULTS AT O. A. COLLEGE.

Year.	Kind of Butter.	Av. p.c. Moisture.	Av. p.c. Salt.
1898	Made from pasteurized milk	12.2	2.9
	" " unpasteurized milk	12.6	3.2
1900	" " pasteurized milk	10.7	..
	" " unpasteurized milk	11.7	..
1901	" " pasteurized milk	13.2	2.8
	" " unpasteurized milk	13.6	2.1
1901	Churned at 46 degrees	13.6	2.2
	Churned at 56 degrees	13.5	2.3
1898	Washed with water at 44 degrees	13.8	2.4
	Washed with water at 55 degrees	13.1	3.4
1901	Washed with cold water	13.0	..
	Washed with warmer water	13.2	..
1898	Small granules	12.9	2.9
	Large granules	12.4	3.7
1900	Granules like clover seed	11.1	..
	Wheat grains	11.4	..
	Larger grains	10.8	..
	Corn grains	14.2	..
1901	Granules fine	12.9	..
	Wheat	13.2	..
	Corn	14.2	..
	No salt	12.3	..
1900	Salted ½ oz. per lb. butter	10.4	..
	Salted ¾ oz. per lb. butter	9.8	..
	Salted 1 oz. per lb. butter	9.4	..
	No salt	12.9	..
1901	Salted ½ oz. per lb. butter	13.1	2.5
	Salted ¾ oz. per lb. butter	14.0	2.6
	Salted 1 oz. per lb. butter	13.4	3.4
1901	Worked once	12.4	2.5
	Worked twice	12.6	2.2
	Worked three times	10.7	2.1

CONCLUSIONS FROM THE O. A. C. EXPERIMENTS.

1. Butter made from pasteurized milk contained from one-half to one per cent. less moisture than similar butter made from raw or unpasteurized milk.

2. A difference of ten degrees in churning temperature made practically no difference in the amount of moisture in the finished butter.

3. Butter made by washing with water at 44 degrees contained an average of .7 per cent. more moisture than similar butters made by washing with water at 55 degrees.

4. Averaging all the results, we find that the butters churned into fine granules and into the size of wheat grains contained the same per cent. of moisture, viz., 12.3. The samples churned into grains the size of corn contained an average of 14.2 per cent. moisture, or nearly two per cent. more than the butters churned into smaller granules.

5. Averaging the results of 190 and 1901, the butters without salt contained the highest percentage of moisture. In 1900 the unsalted butter contained more moisture, and in 19001 they contained less moisture.

6. There was very little difference in the amount of moisture in the finished butter, whether the working was all done at once, or whether half the working was given and the remainder given the same day, after standing three or four hours. The third working given the day after churning reduced the moisture content nearly two per cent.

7. The per cent. of salt retained by the finished butter does not appear to bear any constant relation to the amount of salt added to the fresh butter, although it increases with an increased quantity of salt added, up to a rate of one ounce per pound of butter. Butter salted at the rate of one ounce per pound of butter will lose about one-half of the salt in the process of working. The moisture pressed from butter salted at the rate of one ounce per pound of butter will contain 23 to 24.5 per cent. salt.

8. The amount of moisture retained by the finished butter depends, to a large extent upon the amount of working which it receives.

9. The amount of salt retained by the finished butter depends upon the amount of salt added, upon the amount of moisture in the fresh butter and upon the amount of working which the butter receives.

FRATERNAL GREETINGS.

During the Convention the following telegram was received from the Wisconsin Cheesemakers' Association, then in session :

"The Wisconsin Cheesemakers' Association, assembled at Milwaukee, send greetings. The Badger State cheese and butter makers predict for you a bountiful repast and a rousing Convention."

The reading of the telegram was received with loud applause, and the following message was sent in reply :

"Your predictions for a rousing Convention are being verified. In fact it has been a great success. Hoping the dairy business in which the people of Wisconsin and Ontario have a common interest may keep well to the front, we are yours in the good work."

VOTES OF THANKS.

Moved by E. Kidd, M.P., seconded by T. Carlaw, and unanimously carried: "That the Board of Directors and members of the Eastern Dairymen's Association hereby tender their thanks to the Mayor and citizens of Whitby for their kind treatment in furnishing us with so suitable a hall for holding our several sessions, for interest taken in providing proper lodging, etc., for many of our speakers and members, and for the general hearty reception given to our Association. Also that the thanks of the meeting are due and hereby tendered to the various railways for their kindness in returning our members to their homes free of cost."

The Convention then adjourned.

DAIRYMEN'S ASSOCIATION OF WESTERN ONTARIO

ANNUAL MEETING.

The Thirty-fifth Annual Convention of the Dairymen's Association of Western Ontario was held at the Opera House, in the City of Woodstock, on the 14th, 15th, and 16th of January, 1902.

The meetings were all held at the Opera House, and were well attended. At some of the evening meetings the spacious building was filled. Much enthusiasm was displayed and great interest taken in all the addresses, and the discussion was entered into by a considerable number of members.

PRESIDENT'S ADDRESS.

By R. M. Ballantyne, Montreal, Que.

I feel that my first duty to-day is to thank you for the great honor you have done me in electing me to occupy the position of President during this past year, when you knew I would not be a resident of this portion of Canada. I cannot express to you how much I appreciate it, and it has been my constant regret that I have not been able to be of more service to the Association. It is with regret that I note there has been a falling off in exports of cheese for the past year, but I am pleased to say that we have made an increase in our export of butter. From the 1st of May until the close of navigation of the past year there were shipped from Montreal 1,791,613 boxes of cheese and 410,393 boxes of butter. To the shipment of cheese from Montreal there should be added a shipment of 217,509 boxes from Portland, 14,633 boxes from Quebec, 34,000 boxes from Halifax, and possibly 50,000 from New York, making a total of over 2,100,000 boxes of cheese shipped between the 1st of May and the 25th November; and as it was estimated that there were 550,000 boxes of cheese in Canada on this date, this would give us a total of 2,650,000 as the make of Canadian cheese during the past season, against a make of 2,800,000 for the previous year, showing a falling off of 150,000 boxes during the year, but as a large quantity of milk was transferred from cheese factories to creameries in the east, our export of butter has increased, and has more than made up for the falling off in cheese. Our shipments of butter from Montreal, from 1st of May until close of navigation, were 410,893 boxes, as against 256,563 for the same time last year, showing an increase of 154,330 boxes during the season of navigation; and as the milk that will make one pound of butter will make two and one-quarter pounds of cheese, it is quite evident that the make of Canadian dairy products during this past season was greater than ever before in the history of the trade. So that, instead of having a decline in the export of dairy products, as many people believe, the fact of the matter is we have had an increase equal to 200,000 boxes of cheese; but the increase has been in the shape of butter. On the other hand, the price of cheese has been much lower than last year, and the value of the export less.

Since I have gone to Montreal I have of course seen a great many cheese from all the cheese-making sections of Canada and northern New York State. I have also seen considerable quantities of butter from the different butter-producing sections. I have had many opportunities of comparing the quality of both butter and cheese from these dif-

ferent sections, and I can say to you that the cheese of the section covered by the Western Dairymen's Association compare most favorably with the cheese of any district. I feel, and I know I am right, when I say that the cheese of the section west of Toronto (as a whole) are better cheese than the cheese of any other section in America. Of course there are exceptions to the rule, and sometimes the exceptions seem entirely too numerous, but the statement is true, nevertheless.

The points of excellence in Western Ontario cheese are : Their fine, stylish appearance, greater regularity in the make, well finished ends; and they are better boxed than the cheese of Eastern Canada ; but you have some marked defects that must not be overlooked, and one, if not the main one, is bad flavored cheese.

From observation during the past year, I am satisfied that the practice many salesmen adopt of waiting for a favorable market, has a great deal to do with it. The practice of waiting for a more favorable market is not adopted to any extent in the east, and it should not be adopted in the west. If it is adopted, the cheese that are being held are subjected to a summer temperature, which is usually a high temperature, for a sufficient time to injure their flavor, and for sufficient time to evaporate a large amount of moisture, and make the cheese dry. If the cheese are several weeks old, extreme heat, such as we have in hot spells, will melt a portion of the fat in them, increasing the condition of dryness, injuring their appearance, and causing them to develop bad flavors. I am quite satisfied that the time is coming when cheese will be handled much as butter is now handled, except, of course, that we shall not have freezing temperatures for cheese ; but we will have a cooled temperature all the time from the hoop to the retailer, and we will then have cheese from which the moisture has not been dried out, cheese that have not developed a strong rancid flavor, and, on account of the improved conditions of handling, it will not then be necessary to make the stiff dry cheese we are now making. The increased weight of the cheese alone would more than pay any expense there might be, to say nothing of the better price superior quality always commands.

The Minister of Agriculture at Ottawa has done much in past years to establish refrigerator transportation for butter, and has, during the past year, inaugurated a refrigerator service for the cooling of cheese on a number of ships sailing from Montreal. Those who have been using this service are much pleased with it. The Montreal Butter and Cheese Association have addressed a letter to the Minister, expressing their appreciation of the service, and asking that it be further extended both on sea and on land. They ask that the refrigerator service on sea be so increased as to accommodate all the cheese shipped from the port of Montreal, and they ask that icing stations be established at cheese shipping centres, so that all cheese cars may be iced in summer. The fact is, those who are engaged in the handling of cheese have come to realize very fully the importance of keeping cheese cool all the time, as a very few days of exposure to heat does an irreparable injury to them.

Western Ontario was first to make material progress, and the other portions of Canada followed. I am proud to say you still lead in methods of manufacture, and other sections follow, but after the cheese are made I believe the goods of this section suffer more from heat than the cheese of Eastern Ontario and Quebec, although the buildings of the east are poorer. Cheese there suffer less from heat because they are shipped weekly, and they do not remain long enough on the shelves to take much injury. After they reach Montreal the big cold storage warehouses protect them, and I feel that you must adopt a method of more prompt shipment in summer if you wish to maintain the lead. In the fall of the year all this is changed. Eastern cheese are seldom cured enough, and, as most dealers have no facilities for curing, these fall cheese go forward to England in a much less desirable condition than your western cheese.

A couple of years ago the Minister of Agriculture had a bill put through Parliament, giving to municipalities the power to establish cold storage plants, and I am quite certain the cheese industry would be immensely benefited by the introduction of these cold storage plants in your midst, for the curing of cheese in a properly regulated temperature during the summer season.

During the past season the Directors of your Association took upon themselves the responsibility of collecting a suitable exhibit of cheese and butter to be sent to the Pan-American Exposition, and to them is due practically the whole of the credit that Canada received from her magnificent display at Buffalo. This exhibit has been a magnificent advertisement for us, and we should derive benefits only second to those derived from the World's Fair at Chicago, but this subject will be dealt with more largely by Mr. Paget, who will make the report of the committee who had this work in charge.

Following up the start made a year ago, we are having an exhibition of cheese and butter which we believe will do much to form correct ideas of quality and methods. The judges will be asked to discuss the exhibits most fully with you, and I hope you will make use of the opportunities that will be given to get all the information you can out of them.

I think it would be well if, at the close of the proceedings, some resolutions relating to these matters were passed, especially these icing stations in different sections of the country. I do not think any greater benefit could be done to the country than to have these icing stations established. I know that cheese shipped by ourselves to England the past season arrived in the old country with wet rind, and that a great loss of money resulted.

DIRECTORS' REPORT.

Your Directors for the year 1901 beg to report as follows :

The Queen. The last words occurring in the printed report of the proceedings of our last Convention are "God Save the Queen." Immediately after the close of the Convention came the news of the serious illness, and, in the course of a few more days, of the death of Good Queen Victoria, after her long and glorious reign of nearly 64 years.

Members' Fees. It is now exactly ten years since, on the suggestion of the then President, the annual membership fee was reduced from $1.00 to 50 cents. The object sought in making the change was, first, to increase the revenues of the Association by securing a large proportion of the patrons of the factories as members, and, second, to enable the patrons to secure the literature that is freely distributed to the members. The reduction failed to secure the first object, while the second is now accomplished through the Farmers' Institutes. Your Directors recommend that the fee be $1.00.

Reports. The proceedings of the conventions of 1900 and 1901 have been printed and distributed by the Board. By this means the copies have been in the hands of the members in ample time before the opening of the factories. It is recommended that this be again done; and, further, if the recommendation regarding the fee is adopted, that bound copies be supplied to the members.

Transportation. A resolution regarding better facilities for transportation of dairy products was adopted at the convention in 1901. It is gratifying to see that the Dominion Department of Agriculture is alive to the extreme importance of the question to the dairy interests.

Chemical Investigation. A resolution urging the appointment of a chemist and bacteriologist to assist in solving the many problems that arise in the dairy business that require their aid was also adopted at the last convention. The Board appointed a committee to lay the matter before the Government of Ontario, with the result that arrangements have been made by which the staff of the Ontario Agricultural College may conduct such investigations. Prof. Harrison has made some investigations during 1901 and will report the results to you during this convention.

Pan-American and Glasgow Exhibitions. Your Board, while recommending that steps should be taken to make suitable displays of dairy products at the Pan-American and Glasgow Exhibitions, and while expressing their willingness to assist in selecting the exhibit, felt that it would not be justified in expending any of the Association funds for these purposes. The Department of Agriculture, Ottawa, attended to the Glasgow

Exhibition, while the Department of Agriculture, Ontario, appointed a committee, comprised of members of your Board, to select and make a display at the Pan-American Exhibition, the Department bearing the expenses, except that of transportation, which was taken care of by the Department of Agriculture, Ottawa. A further report on the Pan-American will be submited to you.

Instructors. The same policy regarding instructors was adopted as in recent years. They were requested to confine their work to instruction only unless specially requested by the manager to test milk for the purpose of discovering adulteration, and also not to prosecute unless so requested. They were also to discuss the best means of caring for the milk at the meetings of the patrons if any such were held on the evening of his visit. The instructors' reports will show what has been accomplished.

Your Directors have for years felt that the funds at their disposal for instruction should be spent on those who were willing to co-operate and bear a portion of the expense, and have hitherto acted accordingly. This year an exception was made in the case of the creameries, the Association paying the factory fees for the first visit, so as to enable them to see what they could gain. The result will be explained in the report of the instructor at creameries. Now that they have had the experience it is hoped that in future they will be willing to take advantage of the assistance provided, and pay the small charge that is made to assist in providing for the expenses.

The very great increase in the production of creamery butter, as shown by the exports, warrants the Directors in urging upon the creamery men that they should use every means available in improving the quality and further increasing their production.

Thanks. The thanks of the Association are due to the Grand Trunk Railway and to the Canadian Pacific Railway for granting a concession that has long been wanted, and the want of which has caused much inconvenience in former years, the granting of free tickets for the return trip without any guarantee as to numbers.

The thanks of the members are also due to the Canadian Salt Company of Windsor for their donation of the very beautiful members' badges for the convention.

One Day Conventions of Patrons. It is recommended that, during the month of February, a series of meetings of patrons be held in centres of dairying. There are many places at which such meetings could be held with advantage, but which have not accommodation for holding the Annual Convention. The third day of this convention is to be considered the first of the series, and is somewhat of the nature of a venture, but one which is thought should be made successful.

Programme. During this convention subjects will be discussed of the greatest importance. No effort was needed to think of subjects for discussion. They came without asking. They are live questions, and appear to your Board to cover the whole dairy business: (1) The supply of raw material to the factories; (2) buildings and equipments; (3) skilful makers; (4) the care of the product; (5) the marketing of the products; (6) its transportation; and there you are. These subjects will be all before you, and it is to be hoped they will be thoroughly threshed out in discussion.

Grants to Fairs. Your Directors made the usual grants to the Industrial and Western Fairs. In this connection it is pleasant to report that one of your representatives, Mr. A. F. MacLaren, M.P., has been elected as a member of the Board of the Industrial Fair. Through Mr. MacLaren the great dairy interests will be carefully looked after at the Industrial.

All of which is respectfully submitted.

God Save the King.

The President: Mr. Harold Eagle suggests that I should mention that the $1.00 fee would cover a bound copy of the Annual Report, and that a fee of 50 cents would pay for a paper cover report.

Moved by the President that the report of the Directors be adopted.

Mr. Goodhand: In rising to second the adoption of the report, I desire to say that the Directors of the Industrial Exhibition, Toronto, have made a grant of sufficient money

to erect a suitable building for dairy exhibits at that Fair. This has been due mainly to the influence of our Director on that Board. We will have better accommodation there in future, and we, as dairymen, can offer them our congratulations. We hope that they will put up a building where we can have the accommodation that we have not had in the past, and so that we can go there and enjoy ourselves while examining the dairy products of this country. The motion was carried.

FINANCIAL STATEMENT OF THE DAIRYMEN'S ASSOCIATION OF WESTERN ONTARIO FOR THE YEAR ENDING DEC. 31ST, 1901.

RECEIPTS:		
To bal. from previous year.	$ 1,073 69	
Membership fees	186 00	
Legislative grants	4,000 00	
From prosecutions	27 50	
Factory fees	828 75	
Outstanding from 1900.	53 88	
Total receipts		$ 6,169 82

PAYMENTS:		
By grants to other societies		$ 150 00
Cash paid for prizes....		318 00
Convention expenses ..		561 27
Officers' salary		360 00
Directors and committee meetings		329 10
Printing and postage of Annual Reports ..		153 00
Printing and stationery.		50 74
Postage		43 76
Instructors' salaries and expenses:		
Jas. Morrison $1,028 00		
Jas. Bristow.. 610 00		
Arch. Smith.. 1,145 75	2,783 75	
Instructors' supplies ...	4 00	
Reporter .. .	70 00	
Cheese & Butter Makers Association	100 35	
Liabilities outstanding for 1900	221 97	
Membership fees retur'd	1 00	
Total payments		$5,146 94
Balance on hand.....		$1,022 88

Mr. J. N. Paget, in moving the adoption of the report, said: It gives me a great deal of pleasure to move the adoption of the report. As you will see by the report of the Secretary-Treasurer, the Directors of your Association have handled considerable money during the past year, and you will also notice that the greater portion of that money has been spent in instructing cheese-makers, not only in these factories, but instructing the producers of milk. The Association has been directing their attention more along that line during the past few years than ever before, and we realize more and more every year that that is the great and important matter that we ought to instruct upon. The men who are producing milk from which the cheese and butter is being manufactured, are the people who need instruction. We have endeavored to economize in every way possible during the year, and I have very much pleasure in moving that the report of the Secretary-Treasurer, as read, be adopted.

Mr. Harold Eagle, in seconding the adoption of the report, stated that it gave him a great deal of pleasure to do so. He felt that the funds of the Association had been well handled, and that every dollar had been placed where it would do the most good.

REPORT OF INSTRUCTOR JAMES MORRISON.

I take pleasure in presenting to you my fifth Annual Report.

District. The district in which I was employed was the same as last year, namely., the Counties of Oxford, Norfolk, Brant, Haldimand, Lincoln, Welland, Wentworth, Halton, Peel and Waterloo.

Applications. I received application from 37 factories for 137 visits. Of these I attended to 127, and Mr. Bristow kindly made three visits for me. The others, on account of the small make, and not being able to visit them earlier in the season, were cancelled.

Term. I commenced work for the Association on the 30th of April, and finished on the 4th of November. Applications were also received from ten factories for fourteen meetings of patrons to be held in the factories in the evening. I attended to seven of these; three were not held on account of notice not being sent to patrons in time; one on account of rain, and the others were applied for too late in the season to get the patrons to attend. These meetings are the means of a great deal of good when they can be held early in the season, in May or June, or before the patrons commence haying ; after that time it is impossible to get a good attendance. In fact, it seems to me that the patrons who need instruction the most are the ones who are hardest to get to attend a meeting of this kind. At the meetings held there was always a good attendance, and some lively discussions arose on the feed and water for cows, and milking and care of milk. Some patrons admitted that they did not think it was necessary to strain the milk at home, as it would all be strained at the factory. I am satisfied these meetings had good results to many of the patrons who attended them, causing them to put into practice some of the things brought out in the discussions which they would not otherwise have done. In many of our factories now the makers are doing good work with the milk that they receive. What we need so as to improve the quality of our cheese is to get a better class of milk delivered at the factories. I am satisfied this can be done in many cases by having some one to address the patrons on the care of milk at their annual meetings or at meetings held at the factories early in the season. In my opinion this should be the principal part of the instructors' work next season through the months of May and June.

Milk Testing and Prosecutions. I tested 5,151 samples of milk with the Quevenne Lactometer, and 2,860 with the Babcock Milk Tester. Of these samples I found 47 had been tampered with. I warned 21 of these patrons personally and 18 by letter ; the others were warned by the owners or Directors of the factories. Two patrons, besides the warning they received, were assessed $3.00 and $5.00, respectively, as damages to the factory. These warnings with some patrons may be as lasting as a prosecution, but in many cases it is of short duration, as they are only waiting until they think it is safe or until after the inspector has visited the factory, then they return to their old practices again. Such patrons should be not only prosecuted, but expelled from the factory. But until the makers will all agree not to accept milk from any patron who has had his milk rejected at a neighboring factory, just so long will the patron who feeds turnips or tampers with his milk get in his dishonest work.

Paying by Quality. Eight of the factories visited this season were paying for milk accordng to quality. I know of no better way of having milk cared for, or honest milk sent to the factory, than to pay each patron according to the quality of the milk he sends. In testing the composite samples of milk at some of these factories I found that many of the patrons were very doubtful about the reliability of the Babcock tester in being able to determine the per cent. of butter fat in the milk, but many of them are soon convinced by an explanation or by having them watch the operator while testing. I am fully convinced from what I have seen during the past season that the patrons take better care of their milk in every way, in cooling, airing, and stirring, so as to get the highest test possible for their milk at the factory, and do not take that little pitcher of cream for porridge, tea, strawberries, and such like (we so often hear about), as many do where the milk is pooled instead of paying by quality.

Factory Buildings. Many of the factories now are in fair conditon for cheese making; many of them are much improved from what they were a few years ago. No doubt there are some old factories that cannot be fitted up as they should be until they are replaced by new buildings. Ninteen factories had ice to use in controlling the temperature of the curing room, two factories had sub-earth ducts. Of the two systems I would prefer the sub-earth duct, as there is a better circulation of air, and the cheese are not so liable to mould. Neither system, as used, is perfect or will keep the temperature low enough in a continuous spell of warm weather.

Whey and Whey Tanks. The majority of the whey tanks at the factories are kept cleaner than they were a few years ago, still there is room for improvement in many cases. Thirty of the factories visited return the whey to the patrons; at five factories the whey is fed at the factory or drawn a short distance away and fed there; at two factories part of the whey is fed at the factory and the balance is returned to the patrons.

Curd Mills. Most of the factories where a power curd mill is used have the Barnard mill, which does first-class work when the mill is in proper shape, but many of them which have been in use for some years are in very bad shape, caused in some cases by running too fast and straining the mill. In others, the boxings on the shaft having worn out, it does not force the knife all the way through the curd, leaving enough curd uncut at each stroke of the knife to cause the curd to topple over in the box, which causes it to be cut up much finer than should be. Some mills will not feed themselves without the operator forcing the curd down into the box; all that is required is to brace the mill so it will remain solid when running, tighten up the boxings and lengthen the shaft so as to cause the knife to cut clean through the curd at each stroke.

Washing Curds. More of the makers have practiced washing curds this last season than formerly. Unless with a very fast working or sour curd I would not advise washing at dipping as with an ordinary working curd. It is apt to check the acid too much, causing the curd to be too long maturing. To wash after milling, with six or eight pails of pure water, at a temperature of 94 to 100 degrees, according to the season or to the temperature of the room, will give good results in expelling white whey and flavors, and also gives the curd a silkier feel. As washing of curds tends to weaken the body of the cheese care must be taken not to salt too early, as this has been the means of a great many open cheese.

Bitter Milk and Flavors. The trouble from bitter milk seems to be spreading into new sections or to factories where it has not existed before last season, while in some factories where it caused a great deal of trouble some years ago it has been agreeably absent altogether last season. But Prof. Harrison will deal with this subject, and I hope the makers will discuss it thoroughly with him to find out the cause, and also the means to prevent it in future.

Quality of Cheese. I found many of the cheese early in the season, in June and first part of July, were of a coarse, harsh texture, caused in many cases by allowing the acid to develop too much in the sink. Curds that are not well cooked, or firmed up at the time of dipping, require a great deal more stirring when dipped than a well cooked curd. This was not always done, leaving too much moisture, and causing the acid to develop very rapidly; in many cases not enough to hurt the color, but spoiling the texture. Later in the season the cheese were of much better quality, although in some factories the cheese were weak and open, caused by too much moisture, light salting, and not maturing enough before salting. The milk, being richer in the fall, giving a better yield of curd and retaining more moisture in the curd, requires more salt than is often used to give body to the cheese.

In conclusion, I would recommend the makers to be very particular regarding the quality of the milk received next season, and accept none but what they can make into first-class cheese. Only in this way will we be able to uphold the reputation we have maintained at the Pan-American and other fairs open to the world. Also to keep on improving our factories, and on no consideration to accept milk rejected by another factory for any cause whatever.

REPORT OF INSTRUCTOR JAMES BRISTOW.

I take pleasure in presenting to you my first Annual Report as instructor at cheese factories for the Dairymen's Association of Western Ontario.

District. The district assigned to me comprised the Counties of Elgin, Middlesex, Essex, Kent, Lambton, and parts of Huron, lying south of the Buffalo and Goderich division of the Grand Trunk Railway.

Applications. Applications were received from 24 factories for from one to five visits each; also from three factorymen wishing to hold meetings of their patrons for the purpose of discussing the best methods of caring for milk so that it might be in the best conditon for cheese-making.

Term. I commenced my duties on the 9th of May and finished on October 18th. I spent seventy days at cheese factories testing milk and giving instructions in cheese-making.

Milk Testing. At the different factories I tested 4,082 samples of milk with the lactometer and 406 samples with the Babcock tester. I found 26 samples of milk that had been tampered with. Twenty-four of the patrons from whose milk these samples were taken were allowed go with a warning and the other two settled with the company.

At two of the factories I visited there was no Babcock tester. At one factory they paid for the milk according to the quality, and the system seemed to be giving very good satisfaction.

Making Rooms. Speaking of the making rooms of the factories I visited some were first-class buildings and kept in good conditon, but quite a number were far from being first class. The principal defects were poor buildings and bad floors, which allowed the whey and wash water to leak through, causing a bad odor around the building.

Curing Rooms. For the purpose of controlling the temperature in the curing room the most of them have ice boxes, and at three of the factories I visited they had sub-earth ducts, and at six factories there was no means whatever for controlling the temperature of the curing room. At one of the factories, where there was no provision made to control the temperature of the curing room, I have seen the thermometer register 91 degrees. In such a room as this we cannot expect to find a fancy quality of cheese. I would strongly recommend all factorymen to provide some means to control the temperature of their curing rooms in hot weather.

Whey. At two of the factories visited the whey was fed at the factory, the remainder of them returned it to the patrons in the cans.

Whey Tanks. Most of the whey tanks at the factories were elevated, and were kept fairly clean, but a few still have them under ground, and are not, in a number of cases, kept very clean, as it is almost impossible to keep these underground tanks clean. I would advise factory managers to elevate their tanks, so they may be easily cleaned, for I think that a great many flavors with which cheesemakers have to contend are caused from filthy whey tanks. The makers should insist on their patrons emptying their cans as soon as they are returned, and have them well washed and scalded, also well aired, before putting the milk in them.

Before concluding my report, I would strongly advise makers before starting in the spring to see that the floors, vats, and everything about the factory are in proper condition, and keep them so throughout the season, and by doing so you will be fully paid for your labor.

REPORT OF INSTRUCTOR ARCHIBALD SMITH.

I herewith present to you my third Annual Report as instructor at cheese factories and creameries.

The northern district was alloted me for cheese factories and all western Ontario for creameries.

I spent 124 days giving instruction at 71 factories, and also addressed 50 meetings of farmers who were furnishing milk to the various factories.

Three persons were fined from $10 to $25 and costs for furnishing adulterated milk and one settled with the Directors of the factory by paying $7.

Unfortunately, we cannot claim any improvement in the quality of the cheese made in Western Ontario this season, partly owing to the very hot weather during the summer and also to the poorly constructed curing rooms and unsanitary condition of some factories, but more particularly to the condition of the milk delivered by the farmers, owing to its being very poorly cared for at home.

The curd test is one of the cheese-maker's best friends, and should be in use in every factory. They can be purchased for about $5, and I would advocate using pint sealers instead of bottles with wooden corks, as it is the most effective means of detecting bad flavored milk. I used it this year at nearly every factory I visited, and very seldom used the Babcock test. It is of more importance to the dairy industry of this Province that the farmers be prevented from furnishing bad flavored milk, which causes such a serious loss of reputation and money to the makers and other patrons than that a few farmers be prosecuted for adulterating their milk.

The creameries were all visited once free of charge, which was much appreciated by the butter-makers. It is apparently the only way by which we can reach them and assist them in their work of improving the quality of our butter, and I would urge a continuance of the system adopted this year.

The system of holding meetings was highly commended by nearly all of the makers in my district, and the fifty meetings which I addressed were (with the exception of a very few) very well attended, and the second meetings were usually much better attended than the first, owing to the fact that the farmers became better acquainted with the objects of the meetings and more interested in improving the quality of the cheese and butter. In districts where dairying was the chief source of revenue for the farmers they turned out in largest numbers, but in other districts where dairying is only a side issue it was a more difficult matter to reach them.

Our butter at present enjoys a fairly good reputation on the British market, but there is still much room for improvement, more particularly in connection with the cream gathering creameries, which produce immense quantities of butter, which is frequently held in unsuitable storages for too long a time, and the flavor is spoiled before it reaches the market. One of the chief defects in the butter is excessive moisture, and poor keeping quality, which is largely due to the care the cream receives at the farmers' home, the high churning temperature, and lack of skill on the part of the maker.

Where the temperature of the storages at the creameries cannof be maintained below 38 degrees Fahrenheit the butter should be shipped out weekly and consumed while it is fresh. A number of creameries have well constructed storages and have received the Government grant, but only a few of them are now using sufficient ice to keep the temperature low enough.

Methods of Improvement. In order to improve the quality of Canadian cheese and butter we must encourage the farmers to make a specialty of dairying instead of a side issue, and devise some efficient means of reaching the farmers and induce them to improve on their methods of caring for milk and cream, and deliver it at the factory in a condition that will enable the makers to handle it to the best advantage, by illustrating to them the enormous losses sustained by themselves and other patrons by following their present methods, and the serious injury to the reputation of the maker, the factory, and the dairy industry of the Province. We must renovate the old buildings and build better

curing rooms and storages, in which the temperature can be controlled, also improve the equipments and insist on better sanitary conditons. Employ more skilled makers at better salaries and endeavor to keep the best men in the business, pasteurize the whey, or, better still, stop returning it to the farmers, and send the can home clean. Encourage the holding of local cheese and butter exhibits, where the makers could meet and have their goods scored by expert judges, who would explain in detail their defects and offer suggestions for improvement. This would serve to educate the makers in the requirements of the market and stimulate them to do their best. Try and induce every maker to take a course at a dairy school, also to join these Dairy Associations; attend the conventions and profit by whatever suggestions and instructions may be offered.

Discourage the existence of small factories and encourage the building of larger ones. Study carefully the profits of dairying and the best methods of carrying on the work, both from a farmers and makers standpoint.

A sufficient number of instructors should be employed to visit every factory in the Province as often during the season as is necessary to insure a uniform and good quality of goods. They should be given authority to enforce better sanitary conditions, and report the work of careless and incompetent makers, and instead of using the Babcock test and lactometer to detect adulterated milk, the curd test should be used more to detect bad flavors.

More time should be spent in addressing farmers' meetings and illustrating to them in a practical way the condition of the milk or cream as delivered at the factory, and the effect on the quality and value of the products and the necessity of greater knowledge in the production and care of milk and the requirements of the market.

Makers should unite to protect themselves, and the farmers who furnish good milk, against those who do not; and practice to a great extent the doctrine of co-operation, which means that each works for the benefit of all, and all work for the accomplishment of one object—the improvement of the quality of our cheese and butter, that we may be able to compete successfully with the products of other countries, and that our dairymen may receive the greatest possible revenue for their work and encourage them to engage more extensively in the business.

After the appointment of a committee, consisting of Aaron Wenger, James Connolly and J. N. Paget, to receive applications for one day meetings, the discussion of the inspectors' reports was taken up.

Mr. Publow: I would like to ask the instructors whether there was more need for instruction to the patron or instruction to the cheese-maker.

Mr. Smith: Throughout Western Ontario the conditions are different to what they are in the east. We have much larger factories and fewer young makers, but we find we have just as much difficulty in getting as good quality of milk as they have in Eastern Ontario, and we believe there is more necessity to educate the farmers along these lines than there is in educating the makers. My own view of the question is this that so much time need not be spent in educating the farmers as we sometimes think, but that this question of improving the quality of milk lies very largely within the hands of the makers themselves. If there was just a little more co-operation on the part of the makers, and not so much strife and competition, it would be a comparatively easy matter to secure better quality of milk. If the makers would only agree not to accept any milk that had been refused by another factory on account of bad quality, it would then only be necessary to inform the patron that he had to take better care of his milk and he would do so. At the present time they tell you they can go some place else with their milk, and you are almost at their mercy.

Mr. McFarlane: Does every cow's milk make as good cheese when it goes to the factory?

Mr. Smith: It depends on the quality of the milk, the amount of butter fat, and the flavor. There would be just as great difference in different cows' milk as there would be in the different curds. No doubt every cow would give good flavored milk if she was in good conditon, and if it was well taken care of after milked.

Mr. McFarlane: Can you give us any experiments on that?

Mr. Smith: That is something we do not experiment on. I can see no reason why there should be any difference. It will make just as good quality of cheese if it has the same amount of butter fat and is well taken care of.

Mr. McFarlane: No, it won't.

CHEESE-MAKING.

By G. G. Publow, Eastern Dairy School, Kingston.

I am to speak to-day on the difficulties or the causes of the irregularity in the quality of our cheese. From some observations I have taken I find that it is due entirely to a lack of knowledge, on the part of the makers, of the principles of cheese-making; not so much how to do things as why they do things. That is, they do not understand why they should use rennet, its action, the effects of moisture, and the effects of temperature, and the effects of salt.

Now we find in cheese-making that the factors that produce quick-ripening, or fast curing, of cheese are these: Milk with high acidity, large quantity of rennet, excessive moisture, low salting, and high temperature of curing. These combined produce soft cheese, fast curing, with poor keeping qualities. The factors that we find producing long keeping cheese are, sweet milk, smaller proportion of rennet, higher cooking, larger or greater amount of salt, and lower temperature for curing.

Makers should understand these things, but we find that 50 per cent. of those who come to the Eastern Dairy School do not know anything at all about them. They have been taught how to cut a curd, how to cook it, and how to stir it, but not why they do these things. And this, I claim, is the reason of the irregularity of the cheese we find in our section. Now, if you know these things, what will you do in the spring of the year? Have high acidity in the milk at the time of adding the rennet, use more of it, cook a little more to insure moisture, use a little less salt and have a little higher temperature, and that will insure your cheese fit for the market early. I cannot lay down any cast-iron rule for making the spring cheese, other than that you will have to educate yourself and watch the market, and if the market is poor in the spring, no cheese, they will require cheese of that character that will be ready for consumption at an early date, and you will have to govern yourself accordingly. If the market is loaded with cheese, they do not want cheese to be ripe quite so early, and that means we must make the cheese in such a manner that they will not be ripe quite so early.

Now, the object in cutting the curd is to facilitate the expelling of moisture. That is why we cut the curd. It should be cut in such a manner that it will expel the moisture uniformly; that is, every piece of curd should be of the same size, if possible. If you understand the principle of cutting, you will be able to control the curing and its action. We find the acid is developed in the curd, and not in the whey around it. If we have fast working milk, we should cut the curd finer at the start to let the whey out; and, if the milk is sweet and working slow, we should cut the curd larger, so as to retain the moisture, and so as to have the right acidity by the time the curd is firm enough.

The cooking of curd requires the same attention. The curd should be cooked in accordance with the fermentation. That is, if the curd is shrinking rapidly it should be cooked rapidly, if it is shrinking slowly it should be cooked slowly. Makers must educate their sense of touch, so that they can tell by the feel of the curd, or touch, in what manner it is going on. Some cheese are injured from the lack of cooking. You

should have the right body by the time the right amount of acid is developed. You pay too much attention to getting it cooked up to 98 or 100 degrees, regardless of body or texture, and then try to remedy the defect by rough stirring afterwards. Unless you have the texture of the curd right by the time you have got enough acid you cannot make it fine afterwards. You can make it dry, but you will make it hard and coarse in grain by excessive stirring. The acid, I said, was developed by the amount of moisture in the curd, and the temperature attained. It is important then that we should know when we have the right amount of moisture for the acidity we have in the curd. The more moisture you take out, the more acid is developed. We find that you want to have a certain amount, with a certain dryness, to give a certain character of cheese, that is, a cheese that will be silky—firm and yet silky. The milling of the curd is done so as to get the salt evenly distributed. It should be done in such a manner that it will be uniform. Salt is added to the curd to give flavor and texture, or body, to the curd. It retards the action of rennet, and, in so doing, it lengthens the keeping quality, and if we realize that we will use a smaller proportion in the spring and as the season advances we will increase that; and as the milk increases in fat we will increase it. In cooking the curd some thought must be taken of the amount of fat in the milk. We find in our work that moisture is retained in proportion largely to the amount of fat. That is, in cooking the curds we have to cook a little higher and a little longer for rich milk to get the same body and texture in the cheese, and we also have to use a little more salt in proportion to the fat. In following out these principles we find we have no difficulty in making a cheese uniform throughout the whole season, and if makers will think more along these lines, and study why they do things, and do them accordingly, there will be a more uniform quality of cheese in the country.

Mr. Millar: I have been delighted with Mr. Publow's address. There is one point I would wish to impress upon this audience, and that is the question of cooking the curd. I think a great many of our cheese are spoilt in the vat. I would like to ask Mr. Publow what is the chief cause of hard, dry cheese?

Mr. Publow: Lack of moisture in the curd at the time the right acidity is developed. Lack of moisture in this way, that is either cooked out or stirred out—generally stirred out. These dry, hard cheese are usually made from the curd being over dry, cooked fast and then stirred excessively after the whey is removed.

Mr. Millar: That might be caused by the use of a starter when it was not necessary.

Mr. Publow: Yes. I give time enough for the moisture to be expelled naturally from the curd. It is more likely to be caused by stiring than cooking.

Mr. Bell: Do I understand from Mr. Publow that he would advise giving it a lower temperature in the spring?

Mr. Publow: Yes; I usually give a little lower for this reason, that there is less fat in the milk. We find we must have the fat or moisture to make the cheese mellow, and we cook a litle lower. Sufficiently high just to have the curd firm, that is not hard and stiff, but just lively at the time you get acidity enough developed; then you will have a nice body and texture in the spring cheese.

A Member: What temperature do you cook at?

Mr. Publow: All the way from 92 to 96 degrees. Sometimes I find the curd sufficiently hard at 92 degrees, other times 96 degrees and some times 98 degrees. I do not believe in cooking any higher than will just get the curd properly firm, so that it will mat well afterwards, and enough moisture out so that the acid will not develop too fast in the vat.

Mr. Bell: We find in our experience that it is a little dangerous to advise cooking low in the spring on account of getting too much moisture, and therefore have too much acid developed at the time they are ready to go. They should go at ten days old, and we find in our experience that cooking up to 98 degrees is best.

Mr. Publow: You should use good judgment in the matter. In the east, if the makers cook high, they are apt to get rather strong cheese, a little too dry. They seem to get the moisture out in the stirring, and they come too slow and the cheese are

inclined to be a little leathery and open. If you get acid enough developed you will get cheese so that they will break down. In my section makers are inclined to get them a little too dry in the spring.

Mr. Bell: What about using an extra amount of rennet to overcome that dryness.

Mr. Publow: The more rennet you use the quicker the cheese will cure, and perhaps it is the safer way to use a larger amount of rennet. Where a man lacks experience it would be a good way.

A Member: Is it an established fact that rennet has effect upon the curing of cheese. Personally I think it has.

Mr. Publow: I used to be of the opinion at one time that it had, but I am rather losing faith in that. We want to stick to what we know to be right till we prove it to be wrong. I believe makers are a little too afraid of using rennet. I was of the opinion at one time that rennet had an important influence over the cheese.

A Member: In September we had a lot of tough, leathery cheese. They said you would think by the feel of it that you could take a block off and almost double it before it would break. I would like to know the cause of that.

Mr. Publow: You did not have acid enough developed for the amount of moisture you took out, or you cooked it too much, or cooked it too high, and that made it tough.

A Member: Would not that be caused by not having sufficient heat in the curing room?

Mr. Publow: I do not think so.

A Member: That cheese was made under the same conditions as cheese made previously and always at the same temperature, why should it make a difference for that one month?

A Member: There is another reason that I think ought to be taken into consideration. The acid and the cooking are no doubt two main tendencies in making the curd dry, but oftentimes, after the curd is dipped and put into the sink, it is exposed too much to the atmosphere, and that curd becomes too dry. It is turned over and over and not covered, and oftentimes I have noticed curds that were all right when taken out were allowed to get too hard simply by evaporation in stirring.

Mr. Alexander McKenzie: This question of salting rennet and acid is very important.

Mr. Morrison: Mr. Publow talks about their cheese being dry. I would like to know how much salt they use.

Mr. Publow: We use about two pounds up to the 10th May. From the 1st May until about the 10th, and we gradually increase and rise, in the month of June to two and a half pounds, and keep that up till the latter part of August or first of September, and then we increase to about three pounds, using good judgment as to the amount of moisture. If the curd was dry in the spring, and we saw that it lacked moisture, we would not put on quite two pounds. We salt in proportion to the moisture in the curd and the fat in the milk.

Mr. Morrison: I find a great many of our makers in the west use about one and a half pounds of salt in May, and increase that to about two and a quarter or two and a half through June and July, and some of them never get over two and a half pounds. I think a great many of our fall cheese are hurt a good deal by lack of salt. I would like to hear from some of the older makers on that point.

Mr. Publow: Probably the circumstances are different in the west. I understand you use curd sinks or racks. In the east they are using mostly the pan. Curds on the rack will drain out and be drier.

The Chairman: Since going east, I may say, I have formed an opinion upon late fall cheese different from any I ever had before, and my opinion is this, and it is based largely on the practice of the section east of Montreal, where the milk is much richer than it is west. In the eastern section they cook their curds nearly all above 100 degrees, and some up to 104 and 106 degrees. 102 degrees is a very common temperature in Quebec, and I have come to the conclusion that our late fall cheese, that had that leathery character, was caused largely because the temperature was not sufficient in cooking these

late fall cheese from rich milk. That is simply a theory of my own. I have had no practice, and I do not know whether the instructors will be able to give you any information upon that point.

Mr. Alexander McKenzie: I was in a factory last fall where the cheese were apparently all right, but they had that leathery texture. I attributed it more to the lack of heat, but it might not be caused by that.

The Chairman: Late fall cheese of this section that have been objectionable, have not been cheese that have been hard, but cheese that have been soft. If they happen to be colored cheese they generally lose their color before mid-winter. If they were a white cheese they would lose flavor, and probably get soft, pasty cheese to a great extent.

Mr. Alexander McKenzie: Was that not caused by not airing enough, that is piling the curds and leaving them in that way.

The Chairman: In the late fall they keep them covered up and pile them up to keep them warm.

Mr. Millar: Is that condition not due to the lack of development of acid in the curd? In the fall of the year the acid develops very slowly. I think it is due largely to the curds not being cooked properly and lack of acid. If you use sufficient acid and handle the curds properly you would have none of that trouble.

Mr. Publow: Acid develops in the cheese from the moisture there. The acid does not stop when you put on the salt, as some makers think. The acid goes on, and that is the reason why these colors get out in the fall. Cook the curd sufficiently long to be lively. It will take longer time and higher temperature in the fall when the milk is rich to bring that about and remedy that evil.

Mr. Alexander McKenzie: Would not it have the same effect by retaining more moisture in the curd? Would not they get color as quickly as too much acid?

Mr. Publow: That is the reason you get too much acid from the moisture. You draw off the curd with an inch of acid and have it acid cut at the time of milling. The secret of making cheese is to have the right body in the vat, have the right amount of moisture. You want good body, and you must have the right amount of moisture at that time.

A Member: Is cheese usually harmed by too much acid after dipping out the whey?

Mr. Publow: Not very readily spoiled there, provided there is not too much moisture there, that it is dry enough. There is not too much danger of giving too much if we have the curd sufficiently dry. Of course, you can make the cheese a little mealy by over ripening at that time, but there is not much danger unless you have a soft curd.

Prof. Dean: Why not use the alkaline test?

Mr. Publow: We are using that now. I carried on the road with me last year the alkaline test with very satisfactory results. We found that the proper amount of acid in the milk at the time of taking rennet is about 2-10ths of one per cent., and in drawing off the whey I draw about the same amount. If the curd was a little dry I use 1-100th more. If there had been a starter used, and the curd worked a little fast, I used about 1-100th less at the time of removing the whey. At the time of salting I tried to have about one per cent. of acid. I find that going back over these factories where the makers were using that the cheese were invariably uniform.

A Member: Where do you get your test in the curd?

Mr. Publow: From the dripping of the whey. That seems to be more reliable than our sense of taste or touch.

Prof. Dean: I consider the alkaline test in cheese making a very important test, just as important as the rennet test or hot iron test. No cheese maker is up to his business to-day unless he uses the alkaline test to show him how much acid there is in the curd. In western Ontario the makers do not use that test In eastern Ontario and in the Province of Quebec there are some makers relying altogether on the alkine test. I believe it is a test which our cheese makers ought to know how to use, and, if they are going to make a uniform quality of cheese the alkaline test is almost a necessity.

A Member: If the curd has sufficient acid and has not the body in the vat would Mr. Publow advise leaving it there until it has sufficient body?

Mr. Publow: You mean would I draw the curd off soft and not have pull enough on my hot iron? No, I would not. We have learned largely by the alkaline test that the acid develops in the whey in the curd and not in the whey around it. The whey around the curd will not sour the curd any more. I would rather have it in the whey till I got a body. I would not draw it out soft. I would firm it in the whey sufficiently firm that it will not mat or run together, and then you will not require to handle it so roughly. We used to think that when it pulled a quarter of an inch of acid we had to take it out. That is not the case. We find we can make better cheese by keeping it in the whey and getting it firm. Do not take them off soft or then you will not make these soft meally cheese. The whey around the curd will not sour it any more, and you have the temperatu: to keep it warm.

Mr. Alexander McKenzie: How far would it be safe to leave the curd in the whey? I have seen it draw out three-quarters of an inch in the whey and the cheese would not be soft, but they would never be fine in texture, and that is just why we ripen the milk to a certain degree of acid before adding the rennet, so that you will get the proper amount of moisture out by the time the acid develops to give it the right texture.

A Member: Just when the curd is working fast is it right to run down or wait and add water?

Mr. Publow: Yes, we do that in a fast curd, where the water is good. It is a good way to do.

Mr. T. B. Millar: Do you know that we are getting on dangerous ground right there. Would it not be better to set this milk sweeter, and not take chances of spoiling your texture and color with excessive acid? I think a good many of our cheese makers accept milk that ought to be rejected. Would it not be better for the makers and patrons and for the industry to reject this milk or insist upon its patrons supplying it in a better condition?

Mr. Publow: Yes.

Mr. Millar: With regard to the starter, I think it is an evil for six months in the year. There is a time we need it, but a great many of our cheese makers are using starter when it is doing more harm than any other one thing in connection with the business.

Mr. Publow: The tendency has been to get the cheese soft. The makers ripen the milk and it is a mistake. If there is any one thing in the system that is responsible for the poor quality it is over ripening of milk, and, say what we will to them they will persist in having the milk too ripe when it is set. Now the rennet test or the alkaline test is used for the purpose of finding out the amount of acid in the milk at the time of setting. We find that to get the most cheese out of the milk and to get it of a fine texture, you must have it sweet enough that it will give you time to handle the curd carefully. It would take about three hours. If it is working faster than that, we consider it over ripe. I would never use a starter in milk if I could get the milk to work of its own accord, that is if it worked reasonably fast. I would rather wait an hour and a half in the morning than go to the bother of making a starter. I will say this regarding starters. While they are beneficial in some instances, there is more damage done by them than there is good. Do not attempt to use a starter unless you understand the proper flavor it should have, and how to make it, and how to keep it after.

A Member: Do you not think that gas will form in the milk if you allow it to stand too long waiting for it to get ripe enough to set?

Mr. Publow: Yes, if it was very dirty, that would be a case in which you would need to use a starter, and that would be the only case. I might say here for your information that on some days at the school when we are carrying on that work of ripening the milk it has not occurred in five instances that the milk thickened up before it ripened. In cases of that kind of course starter is beneficial.

A Member: In cases where the gas is bad, do you not think it would be best to use a starter?

Mr. Publow: Yes. If I was in a factory making cheese where I had trouble with gassy curds, I would recommend the use of a starter, using it intelligently, but be sure to get the starter of a good flavor and be sure that it is clean. And I would recommend that you send and get pure culture from some of the sources we have to-day in Canada, either Guelph or Kingston, and make them according to the directions, and use them according to the directions.

A Member: Why is it that you have a greater degree of acid in the fall when you put in the rennet than you have in the summer? The same degree as shown by the rennet test will not work the same in the fall as in the spring. While I have a theory of my own there may be some who would like to know the reason.

Mr. Publow: Largely because you take more moisture out of the curd on account of the milk being richer. The acid develops from the amount of moisture in the curd. If you take out more moisture it will come on slower, and you develop more acid. In the fall you take out more moisture, and of course you can develop more acid or else it will come slower.

A Member: The theory I had was this, that there are two kinds of acid that work in the milk. The one is a lactic acid, and the other is an acid that the milk takes in from the atmosphere, a germ that is in the atmosphere, that it absorbs in the summer time when the milk is hot. The hot milk absorbs more of this acid germ that is in the air. In the fall the milk being cooler when it is brought to the factory it does not absorb that, and you have to depend almost altogether upon the lactic acid for the rennet test, and that lactic acid works slower than any other acid, and you have to use more rennet.

Mr. Publow: That would be a question for Prof. Harrison.

Mr. Alexander McKenzie: What would cause milk to thicken before it would ripen up for setting?

Mr. Publow: It must be due to some undesirable fermentation which overcomes the lactic acid. You will find this milk will thicken up and will be sweet. I cannot tell what it is due to, but I believe it is due to some filth germ.

Mr. Alexander McKenzie: I have a case before my mind now where I have seen milk in the can thick on the top and still sweet. Why should that be?

Prof. Harrison: The probable reason for the thickening in cases where there is no acid developed is that you may have present alkaline bacterium, which instead of producing lactic acid produces an alkali. Personally, I have never seen a case of thickening without a production of acid. There are usually so many lactic acid bacteria present in milk that they are sufficient in number and strong enough to overcome any alkaline ferments that may be present, but there is a possibility of alkaline ferments getting the upper hand in what may be termed the struggle for existence among the bacteria in milk, and in such cases you may get the thickening without acid.

Mr. Alexander McKenzie: I can understand milk getting thick in the bottom of a can and being on the top perhaps fairly sweet, on account of filth germs or something like this, but when you find milk in the top part of the can thick and the rest sweet, it would puzzle a man who is not a chemist.

COLD STORAGE FOR HOT WEATHER CHEESE.

By Prof. H. H. Dean, O.A.C., Guelph.

During the past four years we have been carrying on experiments in order to find out what is the best temperature in which to cure cheese. We started out with two principles before us. First, we say Canadian cheese is being cured at too high a temperature for the best results, and, secondly, the lower the temperature at which we can get the curing process to take place the better will be the quality of the cheese.

These are the two principles we have had in front of us for the last four years, and I wish very briefly to bring before you the results of our work in this connection.

In 1898 we made experiments in curing cheese at 60 degrees, 65 degrees and 70 degrees. The cheese cured at 60 degrees lost 2.4 of their weight in curing in one month; 65 degrees lost 3.8, and that at 70 degrees lost 4.3. These were small cheese weighing about thirty pounds. A prominent buyer who scored a number of these cheese said the cheese scored at 60 were worth one to two cents more per pound than those cured at a higher temperature. I have summarized in these two statements the main results of our experiments for that year. First, there was a saving of about one per cent. in the shrinkage; second, we got a much improved quality of cheese.

In 1899 we repeated these experiments, and in addition we bought green cheese from two factories in the vicinity of Guelph weighing from 70 to 80 pounds. Cheese made in our own dairy lost 4.4 curing at 60 degrees, cheese from the outside factory lost 2.4, cheese cured at 65 degrees lost 4.5, the larger cheese 2.5. At 70 degrees they lost 4.9, and the large cheese 3 per cent.

In 1900 we repeated these experiments again, because we were not satisfied with getting results once. The man who makes an experiment once and draws conclusions from that experiment will find when he repeats it that he will get altogether different results, and therefore we have aimed to repeat our experiments not only several times during one year but over a series of years, so that we may have the results from different conditions of weather, sunshine and moisture, and so on, and it is only by repeating these experiments for several years that we feel warranted in drawing certain conclusions. In 1900 the results were similar to those of previous years.

Now, to come to our experiment of this past year. The chief object we had in view was to find out, first, whether the cheese would cure at a temperature of 40 degrees in cold storage, second, whether it would be better to put the cheese into an ordinary cooling room one, two or three weeks, and then put them in cold storage. A great many cheese makers say that experiments made with a small quantity of milk are not like factory conditions, and that they are not safe experiments upon which to base conclusions. I want to say right here that there is no man who can take a large vat of milk and carry out a successful experiment, because the milk will get out of his control, and no experiment is worth anything unless the man who is making the experiment controls every other condition, and makes every condition alike except the one point he is investigating, and I would not give you anything for an experiment that does not cover that condition. A large quantity of the milk gets beyond the control of the maker with as a result that the experiment is not worth very much. We put 1,500 pounds of milk in the vat, and five flat cheese weighing about 30 pounds each. We made these experiments in the beginning of April and continued until November. When the cheese were taken from the hoops one of these cheese was put into the ice cold storage at a temperature of about 40 degrees. Our cold storage is built on the system that the ice is put into one end and not moved during the whole summer. The cold air from the ice settles in the bottom and comes into the refrigerator and the warm air goes over the top and comes back, and in that way we have a circulation of air. These experiments have been made from two or four times each month, from April to November. At the end of a week we took out one of the cheese we had put into the ordinary curing room and put it into the cold storage. At the end of two weeks we took another out, and at the end of three weeks we took out another. The fifth cheese remained at an average temperature of about 65 degrees.

What were the results? The loss in weight in curing in which cheese put from the hoops into the cold storage was 2.1 for the whole season. Cheese remaining for one week in the ordinary curing room and then put in the cold storage lost 2.8, and cheese remaining two weeks in the ordinary curing room and then put in cold storage lost 3.2, the cheese remaining three weeks in the ordinary curing room and then put into cold storage lost 3.6. All these weights were taken when cheese were one month old.

The cheese cured at the average temperature lost 4.4 per cent. Now you see we have a difference from 2.1 to 4.4 per cent. between the cheese cured in cold storage as compared with cheese cured in the ordinary curing room. So we see the loss in weight, or shrinkage, was less when we put the cheese into the cold storage after they came from the hoops. The less time that elapses, the less shrinkage. As regards the curing of cheese Prof. Harcourt has not yet finished his work.

Professor Harrison made a bacteriological examination, and so far our results are complete only up to August. We have made no examination whatever of September, October and November cheese. I am talking now from results of experiments made up to August. As nearly as we can judge, cheese put from the hoop directly into cold storage would cure in from three to four months to about the same condition as a similar cheese would cure in an ordinary curing room in about four to six weeks. We were not satisfied with our own judgment of these cheese, so on September 21st we had Mr. Adam Bell, Mr. Steinhoff and Mr. J. W. Muir come to our dairy and score these cheese. They did not know how these cheese were made, in fact, they knew nothing about the experiment. After averaging their scores of all the cheese which had been made up to about the middle of July we find they stood in the following order: Cheese cured in cold storage 91 1-2, in cold storage in one week 90.8, after two weeks 92.1, after three weeks 90.5. You will notice that the cheese made July 6th and put into cold storage at the end of two weeks stood the highest. These same cheese were sent to Montreal and scored by six expert gentlemen, and the cheese made on November 11th scored 92.1 and the cheese cured in cold storage 89.8, put in cold storage at the end of a week 84.8, put into cold storage at the end of two weeks 80. The cheese which had been cured in the ordinary temperature had gone off flavor, so we did not think it advisable to send it to Montreal. The buyers were surprised at the condition of the cheese, they did not believe cheese put from the hoops directly into cold storage would cure, but thought that they would be curded in condition, and probably have a bitter flavor. I myself was surprised at the results. And if the results in the September, October and November cheese correspond with those obtained earlier in the season, I think we may safely say that we need to change our methods in curing cheese. Mind you, this work has but fairly commenced, other experimenters are working. Dr. Babcock and Dr. Russell are working on this problem. Up to the present time all we are prepared to recommend is that the cheese made in the month of July and August, if put into cold storage as soon as possible after they are made, will be better, and we will not hear so much complaint about bad flavor and bad qualities in cheese. And I will go farther than that, and say that I consider it a suicidal policy for these cheese makers to make cheese in July and August and hold them in the ordinary curing rooms of the country, and waste the fat in the cheese, and destroy the flavors, and destroy the body and texture of the cheese. And that our people must realize that if we are going to hold the position which we have in the markets of Great Britain to-day we must change our methods in this respect. It is a waste of good food material to hold these cheese so long in the curing rooms of this country. I do not think that cheese at any time should go above 60 or 65, everything that has been said about improved curing rooms, and about sub-earth ducts, is just as applicable to-day as it was last year, only we are going just one step further and advising you to get them into cold storage as soon as possible. That is as far as our work has gone at the present time, and I think we are on safe grounds.

You ask me how are you going to get cold storage? There are cold storage plants all over the country. For a large portion of the year these cold storage plants are more or less idle, and there is room for our cheese to be put into cold storage, but in case there is no room in these cold storages what are we going to do? The large factories should have a cold storage plant of their own, either ice or mechanical refrigeration. There is a point right there. Talking with a man who has made some experiments in Boston, he says cheese put into cold storage under mechanical refrigeration do not turn out satisfactorily, that they are too dry and crumbly, because the air in the cold storage was so dry that it caused too great evaporation from the

cheese. I do not know about that. I am free to say that there are more things in connection with this that I do not know than there are that I do know.

Our work was done on ice cold storage, where the moisture was 75 or 80 per cent., so if we adopt cold storage we must at the same time have a certain amount of moisture in the air. Large factories should have cold storage where they can put their cheese in hot weather, and where they can put them when the market is not satisfactory. I think the man who owns the cheese often feels that if he could be sure the cheese would keep good he would hold them. I think the salesman should have a place where he could put his cheese where they will not deteriorate in quality. And in the case of the small factories I think we ought to have cold storage at central points. This applies more particularly to eastern Ontario, where there are so many small factories; and in these places where there are so many small factories we must either centralize these small plants or we must provide cold storage where these men can put their cheese, and where the buyer can see a large number without driving all over the country and wasting a great deal of time and spending money inspecting cheese at these small factories. Now the Ontario Government in their wisdom have granted one-fifth of the cost of cold storage to any person who will ask them, the sum not to exceed $500, and I have no doubt that sum can be increased. The Government has provided that co-operative factories or companies of any kind who wish to build cold storage, can build these and have one-fifth of the cost contributed by the Government, the total amount not to exceed $500. I am satisfied that the men who are at the head of affairs in this country are so impressed with the importance of cold storage for our dairy products that they are prepared to assist the farmers and the dairymen of this country to the greatest possible extent. We have on the platform two members of Parliament. One a member of the Provincial Parliament and the other of the Dominion, and these gentlemen will tell you how the Government is prepared to help the farmers and the dairymen of this country if they will only help themselves. But we are very often not willing to help ourselves. We expect the Government to do everything for us. I have brought before you very briefly some points which I consider of the greatest importance in this question of curing cheese in cold storage, and I leave you to think them over.

The Chairman: I have listened, and I am sure you have all listened, with a great deal of interest to Prof. Dean's paper. I happened to see those cheese he sent to Montreal, and I can tell you it is a very great surprise to me to find the cheese in such good condition, and it was a surprise to me they were of such good color. The cheese that were put into cold storage immediately from the hoop were better than those that were put in after two or three weeks. The texture was as desirable as could be. They seemed to have a little more moisture than were ordinarily desired, but they were not excessively moist, while those that were put in at two and three weeks seemed to be too dry. They had much the character of the store cheese when they came out of storage in the winter time—they seemed too dry. These cheese that were put in immediately from the hoop, or one week from the hoop, had the texture of perfect fall cheese, and had none of the flavor we feared they would have. So far as the experiments have gone, they seem to prove that the proper way to handle cheese is to put them immediately from the hoop into cold storage.

Mr. Connolly: How long would you have to cure them in cold storage before you considered them cured.

Prof. Dean: At the end of three or four months. The cheese put directly into cold storage had about the same characteristics as cheese held in the ordinary curing room for four to six weeks. From chemical analysis the amount of soluble nitrogen was about as follows: Cheese put into cold storage directly had the same amount of soluble nitrogen in three months as cheese put into ordinary curing rooms would have in one month. Our results are not yet completed, but, practically speaking, I would say in from three to four months at 40 degrees, that cheese would be in about the same condition as if held in an ordinary curing room for from four to six weeks.

A Member : We would have to wait for our money all that time.

Prof. Dean : That is a practical question. There are buyers here to-day who tell me they have had returns from England this past year that the cheese were bad in flavor, and that the importers are complaining bitterly about them, and it becomes a question as to whether we cannot better afford to wait a little longer than have the reputation of our cheese spoilt. I believe it is possible to get the banks to advance money on the cheese which are stored in cold storage. I do not believe there is any difficulty in advancing money. If we can improve the quality of our cheese I believe the banks and the moneyed men of the country are willing to help us if we will try to help ourselves.

Mr. Millar : Were these cheese boxed when put in cold storage ?

Prof. Dean : In the case of most of our experiments they were put on the shelf in cold storage. We made an experiment in which we put one cheese directly into a box from the hoops, the other cheese we put into the curing room for a week, and then put them into cold storage. I examined both these cheese and they were both equally good, but were both badly moulded, and also two other cheese made at the same time. As far as we could judge from that experiment, a cheese put directly into a well-seasoned box was just as good as those put on the shelf, except that they were badly moulded.

The Chairman : Did you examine the rinds, that is the lower end ?

Prof. Dean : They were not turned at all, just simply put in the box.

A Member : Have you any of these cheese here ?

Prof. Dean : No. we have not.

A Member : Why did you not bring some ?

Prof. Dean : We have a September, October and November cheese. I think we have some of the July and August cheese still in our cold storage at Guelph, and we would be very glad to have any one come there and see these cheese. Mr. Steinhoff. Mr. Muir and Mr. Bell were there and saw them, and we would be glad to have any of you see them.

A Member : How much rennet were you using ?

Prof. Dean : Three and a third of rennet to one thousand pounds of milk. By using more rennet and setting to a lower temperature and cooking to a lower temperature, such cheese in the ordinary curing room developed too much acid. One cheese put into cold storage and compared with the cheese made in the ordinary way, were equal in quality, and we have an increase of over a pound of cheese for a thousand pounds of milk in the cheese put in cold storage. I am satisfied we know practically nothing of these problems.

You should bear in mind that over one-half of the solids in the milk are run out into the whey tank and wasted, and I ask you if there is a greater waste of good food. I think it is possible to retain a large portion of these solids of the milk in the form of cheese or some other form if we knew how to handle it.

Mr. MacLaren : Would it be possible to have any of these cheese brought here so that the cheese makers could see them ?

Prof. Dean : Yes. I intend to return to Guelph this evening, and I can ship some up to-morrow if it is considered advisable.

BITTER MILK AND CHEESE.

By Prof. F. C. Harrison, O.A.C., Guelph.

Since the middle of August almost up to the end of the year we were engaged in investigating what has been termed "bitter milk" and also "bitter cheese," and I will give you a short account of how these bitter flavors occurred. and what steps have been taken in order to study the matter.

In August we were asked to investigate the cause of bitter cheese by a factory in this vicinity. We had samples of curd and also samples of cheese sent us, and from these samples we isolated the organism which, when inoculated into the sterilized milk, produced an intensely bitter, astringent taste. We next made small experiments, just using, instead of your ordinary lactic acid starter, a starter made from these organisms in sterilized milk. This was added to ordinary milk as received at the dairy, and a small cheese was male, and we produced in that cheese a somewhat similar flavor to that which was troubling the factory.

Exactly the same steps have to be worked out in connection with all diseases of the human body or of an animal or whether they relate to the cheese-making industry. These steps are as follows:

First of all, the organism, the bacterium, if it is one, has to be isolated from the diseased man or animal, it is then grown in pure culture and inoculated into a healthy animal, and if it produces the same symptoms as we noticed in the diseased animal and if we subsequently isolate exactly the same germ from the inoculated animal then we can say we have proved the tendency of the germ in the production of the disease, and we have to do the same thing in tracing a germ that may occur in cheese. So the first step we had to take was to isolate this germ, and to produce the same flavor in cheese, and to recover that germ from our experimental cheese. After isolating this organism, which I may state is not a bacterium but a form of yeast I will proceed to study its characteristics and also as to what it produces. Then having achieved these preliminary steps, the next thing was to find out just where it came from, and to do that we had to investigate the bacterial contents, that is the number of bacteria, the character of them, and the kind of them in the first milkings from a number of cows, to see whether this organism came directly from the cows or from some other source. In addition we had to look to the can washings, and to do this we took sterilized bottles containing sterilized water, poured a little of this water into a can, and swished it around a little, then poured it back and replaced the glass stoppers, and then took it back to the laboratory for examination.

There were a very large number of analyses, which took considerable time, and I will give you as briefly as possible the results of these examinations. First of all with regard to the mixed milk from all the patrons. In that milk we found a very large bacerial content, of not only a large number of bacteria, but also very many different kinds. Thus, for instance, the bitter yeast was practically present in all of them. There were but two or three samples in which we did not find this bitter organism present in the milk of all the different patrons. In addition we find a large number of gas-producing bacteria. Some samples contained far more than others. Then, also, there was in this milk a mould which produced a red color. On visiting the factory you would be immediately struck with the color of the cheese cloths. We find in the milk a large number of spores of red mould, which produce a red pigment or paint, and that was the reason of the color in these cheese covers.

With regard to the next point, the bacteria contents of the first milkings of the cows. About some twenty herds were examined, and in no case did we find anything in these first milkings except the lactic acid bacillus and one or two perfectly harmless kind. Now lactic acid bacillus is frequently found in the first milkings of the cows, and of course its presence there is a contamination, but it does not do any harm. We did not succeed in finding the bitter organism in the first milking of the cows' examination. Then, turning to the stables. All stables in which the milking was done of these 82 patrons were examined in the following manner: We took little glass dishes, previously sterilized, and wrapped in sterilized naper. Upon the lower portion of the dish we put some sterilized gum, in order that anything falling upon it might adhere to it. These were prepared in the laboratory, and were not opened till they were exposed in the stable which we wished to examine. Then these little dishes, which consist of a lower dish and of colored glass, were exposed in the stable, and the bacteria which might be floating around there would be de-

posited on the top of this gum and then we replaced the cover and wrapped them up again in sterilized paper and took them back to the laboratory, where proper food would be supplied them, and we would be able to find what kind of organisms were present in the stable. This was done in all the stables, and in no case did we find this bitter organism—in no single instance was it present in the stable air. Of course, these plates were only exposed for a short time, and compared with the large body of air in the stable, they would be very trifling indeed, as they only have a diameter of three and a half inches. In some thirty of these stables we found this red mould present, which caused the color of the cloths in the factory, and I do not doubt but that it was present in all these stables if we had made a thoroughly exhaustive examination.

Another factor that was brought out in these stable examinations was the extremely large number of gas-producing bacteria present. Not only bacteria that comes from manure, but those from fodders. They are injurious on account of the production of gas, but they also gave a nasty, dirty flavor to the cheese, and I believe they are very frequently the cause of the trouble which was prevalent some years ago, mottling, and the flavor of the cheese is extremely bad. So you see you have two or three very undesirable factors which come in from the stable air. We have moulds present which are undesirable, and this large class of gas-producing bacteria, and we have a class of putrefactive forms which are able to give an extremely bad flavor to the cheese.

Then the last examination was the can washings. At some farms there was probably but one can, others two, and sometimes three. And we also examined the washings of some of the pails. The results of these examinations were as follows:

That in some 82 sets of cans examined, 81 contained this bitter organism. In the one exception the man did not draw back to his farm the whey in the can in which he brought the milk to the factory. (Applause.) That, of course, points to a great infection from returning the whey to the farm in the same cans in which the milk was brought, but that does not get down to the bottom of the matter after all, because where did initial infections come from? That was the next point we endeavored to get at. It is a well-known fact that on certain kinds of fruit and on certain kinds of leaves there are yeasts present, and I could cite to you a number of instances in which yeasts are present on certain kinds of fruit from which alcoholic drinks are made. Thus, for example, in India they have a flower called the Mower flower, on which there is a species of yeast, from which the natives make an alcoholic drink, and on account of this organism being a yeast I thought that probably we might find it on fruit, or on some of the leaves of trees, and such proves to be the case. We isolated this organism from the leaves of certain species of maples growing on the farms of a number of these patrons. And that shows you where the original infection came from. The milk stands and the milk cans were kept under such trees, the wind or air would dislodge these organisms from the leaves into the milk can, and of course when the milk was subsequently poured into the milk can, it would act as a perfect food for them, and they would increase there. How far these causes of infection from trees are operating day in and day out I am unable to say; but in connection with these washings of cans, I do not think every can would be infected from the trees, because on many of the farms there were none of these trees present; and on some farms there was a total absence of trees in that neighborhood, yet the uniformity with which this yeast was present in the can washings pointed to the infection from the whey, and the following series of experiments will show you how that is.

We took a can similar to the cans in use among the patrons and infected it with the culture of this bitter organism. It was a can in fairly good condition. We infected it for some twelve hours with this bitter organism, and then the can went through the ordinary washing—that is, it was scraped out with ordinary warm water that you could comfortably put your hands in, and then that was poured off and a kettle full of warm water was poured around the can. We used several quantities of water in that can from two, three, four, five, six and seven quarts. We tried to duplicate the conditons of can

washings as they exist on these farms. A kettle of boiling water is taken from the house to where the can is kept, ten or fifteen yards, so that the water actually arrives at the can with the temperature lower, somewhere from 212 degrees to 190 degrees or 200 degrees. The water with which these experiments were made was at 195 degrees, and we found that where we used two to seven quarts of water, the organism was not killed. We succeeded in pouring off the water and pouring in a little sterilized milk or some other food which these organisms live upon, and in all cases we could recover from that new material the bitter organism, showing that it was not killed by the ordinary method of can washing.

Then these experiments have taken also another turn, in that we have made starters of them and made experiment cheese. These experiment cheese are not exactly similar in flavor to those from this factory, for the very simple reason that the conditions are not absolutely alike. You cannot exactly duplicate the conditions. For instance, there might be some millions of one kind of germ there and some millions of a third kind, and we could not get the same ratio in our experiments. At the time of this trouble a couple of lectures were given to the patrons, and samples were taken, and they were satisfied as to the bitterness of the taste of the sterilized milk that this organism has grown in.

I suppose I should say something about how to remedy this state of affairs, and of course the one that will at once suggest itself to you would be stop sending the whey back to the farm in the same can that the milk is brought in. Unfortunately the patrons do not care to do that. They have probably an exaggerated notion of the food value of the whey for pigs, and on that account they are very loth to give up this whey. But there is one method whereby it can be controlled, and that is by the use of a proper cooling apparatus on each farm, because we have found that by reducing the temperature, the multiplication of this organism is considerably curtailed. It does not increase very rapidly when the milk is cooled down to 65 degrees, but at a temperature of 77 degrees it increases with enormous rapidity. And also in the course of manufacture, directly the cheese gets up to 80 or 90 degrees there is a tremendous increase going on, and the acid which is developed side by side with it does not hurt it, in fact the acid seems to stimulate it, because in a number of experiments we have taken we have seen there is a better growth of this organism when there is 1 per cent. of this acid present than when there is no acid present at all. So you see it is one of these things you cannot control by means of the acid starter. This investigation is not entirely complete. The biology of the organism has not been altogether worked out yet. This is rather information for fellow biologists than for fellow men. At the same time it is of great importance because it helps us in the study of the organism and its environment.

The Chairman : That only goes to prove what we have already contended, that we want more education among the farmers. We have reached that stage in the manufacture of cheese that we want better milk more than better cheese-makers.

A. Member : Will Prof. Harrison tell us why we have the bitter flavor one year, and not for some time after. I think there is a great deal in the way the wind blows. Years ago a farmer would keep two or three hogs around, but now every farmer has a hog pen, and if the wind blows from the direction of that hog pen you get a bad odor. I think the hog pen has a good deal to do with the flavor, and that the patrons of the factories should be more careful in keeping away the smell of the hog pen. I think the bitter flavor comes from the hog pen, and that a good many of the patrons could help considerably by keeping their milk in the opposite direction from the wind when it is blowing from the hog pen, and I do not think there is enough straining of the milk done at the farm.

Prof. Harrison : I think the gentleman here is mixing up two things Bitter flavor can be produced, and sometimes is produced, by other causes than the bitter organism which I have described to you, but a smell is one thing, and an organism is another. Milk will absorb certain flavors. If you leave it in a stable it will absorb the cow or stable odor, if you leave it in the piggery it will have the odor of the piggery. That is simply an absorption of odor, and is quite different from the bitter flavor which

is brought about by the growth or multiplication of bitter organisms. Bitterness may also be brought about by the cows eating certain kinds of weed, as rag weed, and in advanced lactation sometimes the milk of the cow will become slightly bitter, but it is not so pronounced, and if mixed with milk of a larger number of cows in full lactation it will not be noticed. Bitterness may also come from a certain disease of the udder, but these are quite different from the bitterness which comes from a microbic organism, and which causes the production of this bitter substance in the milk, and you can tell the difference between this organism, which is connected with life, and one which is not. Flavor from the absorption of odors is most undesirable when the milk is fresh, and after a time it passes away, and that is the one way in which you can tell an organism or any trouble caused by absorption. You can make experiments yourself, you can take portions of the milk and pasteurize it, and add a little of the milk which you think has a bad flavor, and see if you can produce it in the sterilized milk. If you can you can lay the blame to an organism.

Mr. McFarlane : Which is the best to get good milk from, sulphur water, rain water, or hard water ?

Prof. Harrison : Pure water. What do you mean by sulphur water? If your cows are complaining of rheumatism I would advise sulphur water, but for ordinary use rain water, provided it is pure, would be better.

A Member : Does frozen milk give a bitter flavor ?

Prof. Harrison : I do not think so.

A Member : Would it be injurious to butter or cheese ?

Prof. Harrison : I cannot say that, but I know that in Denmark they use frozen milk very largely. They freeze the milk in Denmark and send it to Paris and Warsaw and Southampton, three hundred miles away, and the milk is bought there and used for consumption, and of course a bitter flavor would be very undesirable and would be much noticed, so I feel safe in saying freezing will not cause bitterness. Of course the great difficulty in frozen milk is that you cannot subsequently separate the fat from the other portion of the milk. It is very hard to get a separation after, and I think that is where the principal difficulty would lie for cheese-making.

CONDITIONS AFFECTING THE CURING OF CHEESE.

Dr. Van Slyke, of the State Experiment Station, Geneva, N.Y., read a paper upon the above-named subject. It will be found in the report of the proceedings of the Eastern Dairymen's Association, Page 42.

WELCOMED BY THE MAYOR.

The evening session was largely attended. An orchestra rendered excellent music, and several songs were sung by the city's best vocalists.

Dr. John Mearns, Mayor of Woodstock, welcomed the members of the Association in a bright speech, which was loudly applauded. Among other things, he pointed out that during the seven years elapsing since the convention had last been held in Woodstock, the place had undergone a change. "We have merged," said he, "from the area of a town to a city, and you, as an Association, have gone on building up your industry and expanding it, and you have succeeded in taking possession of the world's markets. You have gone over to Buffalo, to your cousins in the south, and outshone them there, having, as I understand, come out ahead of them in the matter of cheese and butter. We in Woodstock, situated as we are in the centre of the greatest dairy industry in the Province, in fact of the Dominion of Canada, know quite well, and realize fully, how much we owe to you, how much we owe to your industry, and how much we owe to the conventions you are holding every year. Your prosperity is our prosperity, your education benefits us, and the more money you succeed in putting into your pockets in consequence

of this business of yours, the better it is for us and the more we are benefited. But it not only benefits us, but benefits our Province and country at large."

The Chairman: I know I voice the sentiments of our Association when I say we thank you most heartily for your welcome. I know also that the members of this Association are delighted to come to Woodstock. On this occasion, the first since Woodstock has become a city, they have enjoyed it even more than on any former occasion. It is in the midst of probably the most important dairy section in the Dominion of Canada. I do not know that there is any place where we work up more enthusiasm than we do in Woodstock, and I do not think there is any place where we have a better or more enthusiastic meeting than we have here. We thank you for the accommodation you have extended to us, and for the entertainment that will be provided to-night.

ADDRESS.

By D. Derbyshire, President Eastern Dairymen's Association, Brockville.

About twelve years ago I delivered an address at Appin to our dairymen there to encourage them in the work, and I expressed then the sentiment that this was the original home of the modern dairy, and do you know the Woodstock Sentinel-Review came out furious next week against the idea of such a thing as that, and mentioned men who had started the dairy business earlier here near the Town of Woodstock. But you know we love Mr. Pattullo in the east, and it was a great pleasure for our board to invite him to our convention, and I assure you we feel very thankful to him for attending our convention last week and making the magnificent address he delivered to our Association. It was a great experience to us, and I believe that Mr. Pattullo has done more on the floor of the Local House than any other member in connection with the dairy business. (Applause.) We feel proud of him. It is a great thing to have a man you can whisper to in the Legislature in connection with things that we think quite important, that possibly other members, just as good in their way, but who are not in that hearty sympathy with the work, may not think is necessary.

We have a great many things to do. We have been improving. Of course they talk in the papers that we are not doing anything, and that the cheese business is going back. Still when you come to figure up that we sent $25,500,000 worth of butter and cheese last year, 1901, you will acknowledge that we are doing something, and let any man attend one of our well equipped dairy schools and become educated, and go out among the factories, and he will see that we have made finer cheese in 1901 than ever was made in the history of this Dominion. (Applause.)

I feel proud of that fact, and while we have yet some poorly equipped factories, with ordinary makers, who have been hired on account of their cheapness, yet we make good cheese in the majority of our factories. We have the lesson before us, and the trouble will heap upon our heads if we allow this thing to continue. One of the very discouraging things in connection with the dairy business is that you will see advertisements in some little country paper asking for tenders to manufacture butter and cheese in such a factory. Do you know that thing stirs my blood every time? I think of it every time I see one of these things. In place of looking for a man on account of his ability to make the finest cheese, and paying him the price sufficient to bring his services there, so as to build up the industry in that locality,—in place of doing that they are looking after the cheapest man who will make the cheapest and poorest goods, and where we have them doing that they are sure to make a failure. It rests with the people whether these things will be remedied, and this convention and this Association particularly, and the Eastern Association as well, are looking to the people to wipe these things out, to discard every old factory and put a better one in its place, or uniting two small ordinary factories and having one first-class factory in that locality, with well qualified men to take hold of the work and make a finer quality of cheese than was ever made before. We want the farmers to take hold of the work earnestly with us, and assist us in

this great work by producing a finer quality of milk, keeping everything absolutely clean about their own person, their stables, their milk cans and milk waggons, and everything in connection with this milk until it goes to the factory, and then see to it that they have a proper factory, with a well equipped curing room and well qualified men in charge, who will take a step this 1902 just out of the way of our competitors in connection with this great business.

Now the point is, will the people go home and take this matter to heart, and do these things that we so much desire ? Our Government are perfectly willing to assist. The Hon. Sydney Fisher, Minister of Agriculture, at the suggestion of this Association, as well as the Eastern Association, introduced in the ships the cold-air system, so that the cold air is thrown into quite a few ships, so as to control the temperature of the cheese while in transit, so they would be perfectly cool in the ships, and delivered in the old country in perfect condition. We are delighted that the Minister took this matter up, and we are pleased to know that he has promised to give us an improved service this year with a larger number of ships, so that we can put a larger quantity of our cheese in good condition on the British market. And now you want to go right back home and make the goods right, get them to market right. All our butter is shipped in refrigerator cars, and we want every box of cheese in this country to be taken to the market in the same way, and then we will be in a position to compete with the world, and will take a step in advance ; and we call upon this Association to do the very best thing possible to reach all the makers and all the people to qualify themselves, and to put themselves a step in advance of anything they have done. It is for us as Canadians to take a position in advance of what we have ever done before, and I believe we can make $50,000,000 a year in connection with our butter, cheese and bacon this next year. It requires an effort on the part of every dairyman in this Dominion in getting the milk to the factory in better condition and to improve the waggons. If there is any poverty-stricken looking thing in our country it is the milk waggon, and the milk drawer himself. They have sometimes an old, distressed-looking horse and a worse harness. Why not put on a better and a cleaner rig ; clean everything up, and you will see how quick they will look after our goods in preference to anything else in the world. I am satisfied from letters I have seen that there is the very best feeling in the British market in connection with anything that is Canadian. We have done well for them, we have looked after their interests, and they are interesting themselves with us as they never have in the past.

It is always a great inspiration for me to come west and see what you are doing. A man wants to have a good opinion of himself in order to do the best kind of work, and I can tell you the finest cheese that will be made in this country will be made near Brockville in 1902. (Laughter.) Our people are thoroughly alive to this thing, and at Whitby the other day they expressed their determination every one that they would go home, and that they would improve their factories and do everything in their power to make the best cheese in the world. And we do hope you will do as well as we do, and, if you do, this Dominion will flourish and prosper, and we will all go to glory together, and the dairymen will be the first people there. (Laughter and applause.)

The Chairman : A convention of the dairymen of Western Ontario would not be complete without the genial President of the Eastern Association, and I think he gets a great deal of inspiration from us in the west.

Mr. E. W. Nesbitt, President of Woodstock Board of Trade, also welcomed the convention, and, among other things, said : There is no doubt in my mind that dairymen have still plenty to learn. I have pleasure in saying that during last summer I visited several factories that were beautifully clean, everything good enough to eat off the floor. It seems impossible that a liquid like milk, that is so easily tainted, could be made up into any form of product unless it is kept perfectly clean from the time it comes from the cow until it is manufactured, and even after that I should say it would require to be kept clean. It is not only at the factory, but the farmers who send the milk to the factory should take great care to keep the product pure and clean. A great many farmers are too anxious as to the quantity of milk they produce, without

reference to the quality. I see a number of gentlemen on the platform who keep on telling you something that will be useful, and I hope that every man who is working in the dairy interest in this country will make an earnest effort to do better in the future. I welcome you to the city of Woodstock. I hope we may see you here many times, as we are the centre of the dairy industry. Practically speaking, we are just as much interested as the farmers who make the cheese or butter, because it is largely through them that we keep our existence, and we are all interested in what interests our pockets.

Mr. A. F. MacLaren, M.P., Stratford: I am glad, indeed, to receive such a kind welcome by his Worship the Mayor and the President of the Board of Trade. I hope to have a very pleasant visit among the people of Woodstock, and I hope we will go home carrying with us something new, and that when we go home we will put it into force and will not allow the other countries of the world to go ahead of us. Instead of sending our best men away to other countries we should send them to England to educate the people there with regard to our products in this country, and I would like to see the time when we will have a warehouse in London, England, and Liverpool, and Bristol, and Manchester, and have educated men in charge of these warehouses—men who understand this business, and the poultry business, and the butter business, and the pork business, and all the different lines of products which are purchased in Canada. Men who will be able to talk them up and educate the people over there with regard to them. When over there I heard people talking about America this, and America that. I think the mother country should recognize us more than they do and call us Canadians, and call our products Canadian products.

ADDRESS.

By Andrew Pattullo, M.P.P., Woodstock.

It is no ordinary pleasure, I can assure you, to be with you to-night, and so be able to arrange my duties that I hope to have the pleasure of attending all the sessions of this Dairymen's Convention this week. The kind words of your Chairman and others are scarcely deserved by me. But I think I may say this for myself, that while the pressure of other matters during the last few years has prevented me from taking so direct a part in connection with the work of the Dairymen's Association of Western Ontario, I have never lost my interest either in the men engaged in the work, or in the great industry with which you are connected. While I have been sitting on the platform at this convention I have been in a reminiscent mood. Shadows of the past would come up, voices of the past I thought I could hear to-night. I was thinking, while the gentlemen were entertaining you, of another gathering of this sort, the last convention of this Association, in this same building, a meeting of dairymen, of dairy farmers, and others, and it was regarded as the greatest agricultural gathering of the kind ever held in the Dominion of Canada, and if there is a single regret which I have to-night, it is that along with a number of prominent men who are still here, like my friend Mr. Derbyshire and others, who took part on that occasion, some of the men who were then with us are now absent; and how you wish and how I wish we could have good old Theodore Louis here, and John Gould. These were great men, whom we welcomed on that occasion with open arms, and who gave us such a treat as we soon will not forget. And then we had some of our fellow-countrymen on the platform with us upon that occasion, like the Hon. Thomas Ballantyne and Sir Oliver Mowat. It was a great gathering, but I believe we will be able to equal it to-morrow. While I join with the Mayor of the city and the President of the Board of Trade in their admirable welcome to you, who expressed in apt words the feeling of every citizen of Woodstock, yet I feel almost like apologizing, or shall I say finding fault, with some of our citizens who have not turned out to listen to your deliberations. We have not educated the ladies and gentlemen of the cities

and towns of this country to attend gatherings of this sort. However, with this slight defect, this is a very enjoyable meeting, and I congratulate you heartily on this opening session. I might say with regard to my friend Mr. Derbyshire that, after listening to him, you would be surprised that he has been for twenty continuous years President of the Eastern Dairymen's Association, while we have had about a score of presidents in these years. I mention his name for this reason, he does things so well that he seems to carry everything before him. At that meeting at Whitby the other night which I attended, it was a great delight for me to be there, and do you know we had an audience the majority of whom were comprised of ladies and gentlemen of the town of Whitby. My friend Derbyshire will persist in making people believe the Canadian dairy originated down near Brockville. I was a boy when the first cheese factory was built, and that is a good while ago. Though you can all see I am still very young I can remember that quite well. There is therefore no doubt about the fact that the County of Oxford is the original home of the modern dairy, and is still the greatest dairy county, not only in the Dominion of Canada, but on the whole continent of America. (Applause.)

I said I was reminiscent to-night. I was thinking of that last convention held here, and I was thinking of another, and if I am not giving away my age too much I will tell you that I have been officially connected with this dairy industry for no less than twenty-five years. That seems a pretty long time, but my friend Mr. James S. Scott, whom I am glad to see out to-night, put in my hand an old paper of 1877 in which there is a report of the meeting held in the town of Woodstock for the purpose of establishing the first cheese market. That is a long time ago. I happened to be one of those who were there, and out of that small beginning arose the present cheese board, which used to be the place where they sold cheese. Of course the cheese market is a place where they do not sell cheese—(laughter)—but that is not the fault of the people who made that small beginning. On that occasion they had a banquet, and it is pleasant for me to go back and read the report, and here are some of the names of those who attended on that occasion :

E. Caswell. He was a worthy man and prominent in the dairying industry. David Morton, John Craig, Major Robert Nevell, F. Malcolm—one of the most intelligent dairymen that this country ever saw, a man who did a great deal for the industry here and elsewhere, and who left his mark in the literature of the first agricultural committee which ever sat in the Province of Ontario. The late Captain Chambers, Joseph Pearce, Thomas Oliver, M.P., Joseph Plaskett, Henry Parker, John Douglas, Hamilton Burtch. These were among the men who were at that first meeting, and all of whom I think I may say are now among our great departed. Out of that meeting a great deal came. The secretary at that time was Mr. James S. Scarff. I may mention one fact in conection with the dinner which was held on that occasion. At the dinner I noticed two gentlemen responded to the toast of the ladies, the Hon. James Sutherland and Mr. Thomas Lockhart. Twenty-five years ago they responded to the toast of the ladies, and they have been failing to respond to the ladies ever since—they are still old bachelors. And I noticed a few years afterwards that I was designated along with the Board of Trade, Mr. T. H. Parker, Mr. Scarff and Henry Parker and Robert Wedlow, to attend on behalf of the Board of Trade the Dairymen's Association of Western Ontario. Now, gentlemen, I am sure you will forgive me this little personal reminiscence, going back as it does to the beginning of the active work in the then town of Woodstock in relation to dairying. The town of Ingersoll, to its credit, was a little ahead of us. But what I desire to point out is this, that from a small beginning like that in the way of organization great things have come, and it is just in the same way in connection with this dairy association—out of a small beginning, a few men getting together thirty-five years ago and starting this Association, great things have come, not only to this district, but to the whole of Canada, and to the whole Province and indeed to the whole Dominion of Canada.

We have had already some technical talk of the very highest importance and value. You have had food for thought this afternoon and this evening from a man who is one of the leading experimentalists of the day, a chemist of the great institution in the State of New York, and while he was speaking to-day I was thinking of the extraordinary change that has taken place in public opinion among the farmers since I was younger than I am now. Not many years ago farmers used to sneer at what was called scientific agriculture. Professors then were not so popular as they are now. It was supposed it was not necessary to have educated men in relation to agriculture, that anybody might farm if he had a little common sense and a stiff back. But it has passed now. The men sought after and the men desired, and the most popular speakers are those who are students of agriculture, those men from the Agricultural College, those experimentalists, like Dr. VanSlyke, who comes before you and tells you he could not make a cheese which you could eat with safety, but at the same time tells you a great deal about cheese that it is necessary for you to know. He gives you facts upon which the production of good cheese depends. What a change that is. Speaking as I am to an audience partly civic and partly rural, I think that I, perhaps like some of the other speakers to-night, am going a little outside of what you may call shop talk with this convention, because you know I am not an expert cheese maker. I am not an authority upon any of the technical phases of dairying, but at the same time I will say that I am inclined to think that some of this general talk in conventions does some good, perhaps as much good as talk of the other kind. Variety is the spice of life. There are all sorts of men here and all sorts of men in the world. Some men want to hear one thing and some men want to hear another, and I suppose that is why they ask some of us who are not such authorities as others upon these subjects of dairying to take part at this meeting.

I want to speak to you for just a little time on the work of this Association. Now what do you represent here in this town of Woodstock to-day and this week? You represent a very great deal. You represent the greatest industry in this country. It is very easily said, it is said in a few simple words, but contains a world of truth. This is a great country, a country of enormous extent, a country of vast resources, and still I am able to tell you that you here, organized as you are, represent one of the greatest organizations of the Dominion of Canada. Judged by the volume of its output, judged by its exports to foreign markets, judged by its effect upon the character and happiness and prosperity of the people, I have no hesitation in telling you that the greatest industry of Canada to-day is the dairy business, with which you gentlemen are connected. What has your organization done for the dairy business? It has simply been an educational institution. You know what Harvey Farrington and other men of the early days had to do. You know what Mr. Caswell and Mr. Lacey had to do, and what the men of eastern Ontario had to do. They had to create the industry, and all this dairy business of the present day is literally the creation of their brains and their industry. They were working in the dark in those years. They made some sad mistakes. You remember some of them that Prof. Arnold made which cost us dear. But it is through their mistakes that we achieved success. Perhaps we never would succeed if we did not individually and nationally make mistakes and some sad blunders. They went on working and experimenting, and they won success for themselves and for this district and for this whole country. Now, sir, how has this success been achieved by them and by their successors? It was done in only two ways. First of all by experience. That is about the only advantage we used to have in the early days. We have other advantages in these days. We have experience meetings, as our good Methodist friends would say—we have experience meetings, where we tell one another from the platform or from the audience, what we have been doing, and what the results have been, and we also have experimentalists along scientific lines who are experimenting for us and finding out the best method for doing things. And I think they generaly reach the absolute truth and get down to the bottom of

things. The whole object of this convention is to bring together results and compare them. These conventions, like the Farmers' Institutes, are simply part of the educational system of this country, and I want to say just a few words on that subject of education.

Some people imagine, who have not read the newspaper, and are not watching what the farmers of this country have been doing, and what the Department of Agriculture has been doing, that the public schools and the high schools and the universities of this Province constitute our system of education. Do you know, Mr. President, that with all deference to the Minister of Education, and with all deference to the men who have created our splendid system of schools, having in mind and not forgetting the fact that we took the highest honors at the World's Fair for educational systems, I believe that perhaps the greatest branch of the education of this country, judged by its results and judged by the possibilities of the future, is what I shall call that system of education which is today under the Department of Agriculture in this country. I believe, starting with the Agricultural College which has been so ably represented here to-day, an institution which is the most useful one in America to-day barring none, starting from that with the agencies that go out from it, taking in this dairy convention, the farmers' institutes, and the fat stock show and the experimental farms all over the country, I say we are perfecting a system of agricultural education which is equally important and will yield as great results as what is generally called the whole educational system of the country. Speaking some years ago, and somewhat impatiently, to a well-known and worthy gentleman in the town of Woodstock whom I thought was almost classically mad, I thought he paid too much attention to the value of a classical education. He was a great man for the High Schools and the Collegiate Institutes with which he was associated. I said to him one night something which I did not entirely mean. I meant a good deal of it, but I did not mean it all. I said to him, do you know I should like if some night about half of our high schools and half our cheese factories could disappear? He was absolutely horrified, and we went on to discuss what I meant. I said to him I am a profound believer in secondary education, but I think we have gone a little too far in the matter of high schools, because we are producing perhaps more lawyers and doctors in this country than we need. We are taking the boys away from the farm and from the workshop, and I believe that if we gave them another education they would be better fitted for the duties of life. And if the State was to pay for their education they would get a better return if they educated them in another way. Was I right or wrong? (Applause.)

Thank heaven, we have taken a turn, and we are going more in the right direction now. We are introducing into the public schools more agricultural teaching. Getting into the public schools a little more love of rural life and less of the city life, and I think we are making our high schools more practical because we are introducing manual training and technical training, not for the purpose of making artisans, but for the purpose of helping artisans to improve themselves and to enable their sons to become skilled artisans instead of drifting into a profession where there is no possible chance in life for them. We are going in another direction, and some of the ablest men in this country are beginning to see, as I endeavored to make my friend see, the necessity of turning the thoughts of the people of this country into the necessities of the day. I think every dairyman in this country and every farmer in this country, should honor the memory of the late W. E. H. Massey for one thing which he did, and that is his contribution for the purpose of putting up a special building in connection with the Ontario Agricultural College, and also the magnificent gift of Sir William McDonald of Montreal, whose gift towards agricultural education, like his gift towards the teaching of manual traning in the public schools, is one of the noblest benefactions that we Canadians have ever seen. And so we are going on in this system of giving the farmers and the farmers' sons and the youths of this country generally, the best kind of education to fit them for the duties of life in connection with the greatest industry in the country.

We hear a great deal in these days about university extension lectures. You all know what that means. Why, sir, there is an old saying that if the mountain will not go to Mohamet, Mohamet will go to the mountain. University extension lectures means that while you cannot all go to the university, the university professor will come to you and deliver addresses to you, as they have in the town of Woodstock. There is another system of university lectures, lectures which you have exemplified in this convention, which you have exemplified here to-night. You have a scientific gentleman here to-night who is as skilled and up to date as any in our universities, coming to you to talk to you upon the subject of dairying, of milk and butter and cheese. There is an illustration I say of this great system of University Extension lectures in Agriculture. And so I claim for you, gentlemen, who are now running this dairy association, that you are simply carrying on the necesary work of agricultural education in this country. There is no department where there is such a necessity for modern exertion, for modern efforts, for modern invention, and for modern methods, as there is in connection with the farm. You know the struggle for life is between the industries of the country. You know how keen the industrial struggle is between the great nations of the world. We are told now that as Britons we must see some of the interests of the world wrested from us by our competitors. It is dawning upon us more and more every day that if we are going to succeed as a class, if this country is going to hold its own in agriculture in competition with the United States, with New Zealand and Australia and Denmark and other countries, you have got to make better goods than they. You have got to make the best possible goods and put them into the great markets of the world, the great market of Britain, in better conditions than your rivals, and you never can do that without education. Why did I say anything so dreadful as that I would almost rejoice in the disappearance by fire or otherwise of some of the older cheese factories of this country? Simply for this reason, that some of these old cheese factories have been kept up ten or twenty years longer than they should. When they disappear, of course you get rid of the old bad smells and of a lot of rubbish and of old machinery, and while there may be a little loss and discomfort to somebody, their place would be taken by new factories with new machinery, with new appliances and with new ideas, they would be built according to the latest ideas in architecture, and the result would be an enormous benefit to the community at large.

One of the things that keeps the County of Oxford back in many ways, and which is enabling the southern regions and eastern regions of this country to pass many of the factories of the old County of Oxford, is just because some factories in this country were allowed to stand twenty-five years longer than they should, and these men in the newer regions had built more up-to-date factories.

I have endeavored to communicate to you the objects of these conventions, what they are in the truest and best sense. This Association has lasted longer than Harvey Farrington ever dreamed when he was making his small beginning, and his coadjutator never dreamed that it would have such a far-reaching effect. When Mr. Dunn and Mr. Ballantyne went over to Philadelphia and wrested from the Americans the first laurels which we took from them for cheese, they never dreamed the effect it would have upon us in a national sense. What has been the result in the twenty-five years? We have just gone on adding at the rate of one million dollars a year to our exports of dairy products, until the exports to-day are just $25,000,000 a year. (Applause.) That is the result of original genius and organization and cooperation, and largely the result of these dairy conventions, this great educational system of which I speak. It is a long distance from Harvey Farrington and Prof. Arnold to Prof. Dean and Mr. Ruddick and Prof. Harrison and Dr. Van Slyke. They worked in the dark and to-day we are working in the light. You start in where they left off, but with twenty-five years of knowledge added to it. You can start with a certainty of success and they couldn't. That does not represent even one-half the benefit which the dairy industry which you represent means to this Can-

ada of ours. The pork industry is practically a by-product of the dairy, it never could have been established apart from the dairy, and it largely depends upon the dairy, and we are actually exporting to-day $12,000,000 worth of pork to the British market. What does all this mean? Why, gentlemen, it means national wealth and national hope. The very statement of these figures shows the opportunities that are open to the farmers of this country.

Just now we Canadians are congratulating ourselves on the national outlook. It is bright. It never was so bright in the history of the country. We stand to-day very much better in the eyes of the world than we ever stood before. Not very many years ago we were known as one of the colonies, one of the dependencies of the British Empire. We are no longer regarded in that way. I remember being at the Colonial Exhibition in 1886, and going through there I asked for the Canadian department, and I turned with indignation when one of the attendants said, "There is the American department." I turned upon him using language which I am not permitted to use in the Legislature in this country, and which, perhaps, I could not use in the presence of ladies who are here. But I endeavored in good Canadian English to express my indignation and opinion of the fellow in charge of the Colonial Exhibition, who did not know the difference between Canada and the United States. That is pretty nearly all passed. Still, occasionally, we hear the words "American" over there in connection with Canada, although they are beginning to know Canada, and they are beginning to know Canadian goods, and they are beginning to know Canadians in Britain as they are known all over the world, and they know we are no longer a colony but one of those nations which go to make up the greatest empire the world has ever seen. (Applause.) That is the position we occupy to-day in the eyes of the world. In what I shall call a national sense our position has vastly changed in recent years. They are teaching our boys and girls in the schools to-day about the discovery of Canada, but I tell you the great discovery of Canada has been made during recent years, when the Canadian people have discovered themselves—discovered that they can do something, whether on the farm, in the workshop, in the class rooms or in the Legislature—have discovered that the Canadians are man for man equal to the best men in the world to-day. (Applause.) They have discovered Canada in another sense. A few years ago how many people in this country knew what our resources were. How many people in this country who did not have the idea that this was a fringe of scattered Provinces along the skirts of the United States. As an eminent writer used to put it, "a bundle of sticks loosely tied at both ends." We do not hear that sort of description of Canada any more. They used to think that we in the Province of Ontario had a very small Province bordering on the great lakes. Now we know that we in Ontario have a Province in which you can put half a dozen States of the Union. You can put New York, New Hampshire, Massachusetts, Vermont and Connecticut and Rhode Island right into the Province of Ontario. What do you think of it? It may seem incredible to you, but there it is, and in the boundaries of this Province we have riches we have never dreamed of. We used to know we had in Canada great stretches of timber, but we did not know that in addition to these great stretches of pine, which will last for 100 years, we have an unfailing supply for pulp wood timber, timber for all time to come because it will reproduce itself every twenty-five years, and the Province of Ontario will be a great pulp-producing country. And so it is we have discovered ourselves, and we have discovered our resources. Why do I mention all these things? Simply because I want to point the moral to you that while the Canadian national outlook is bright to-day, while our reputation is being enhanced in the eye of the world, and while we have this fabulous wealth in forests and mines, and the wheat fields of the Northwest, the greatest in all the world, the greatest gold mine in Canada, the real gold mine of this country, is its agricultural resources. In the gold mines in the Yukon and of British Columbia and the silver mines of this country there is apt to be as much money expended in them as is taken out. Agriculture in recent years in Canada has been unusually prosperous, and I believe it is

likely to remain prosperous. The food which we eat does not come from the mine or the forest, but it comes from the farm.

A gentleman whom I used to see in this town weighed down with cares, returned to Woodstock the other day. He had gone to the Northwest, and is a farmer there, and how much wheat do you think he had this year? Just the little sum of 13,000 bushels. We have the highest hopes for the prosperity of the Rainy River district, and I say even the wheat fields of the Northwest do not hold out such marked hopes as the dairy business to the old man and to the young man of this Canada of ours. I have watched the progress of your industry for thirty years, and I can say of it to-night what cannot be said of any other industry in the country, that it has always prospered. Now what does that mean to the young men? It means that if you are in the dairy business, and if you follow the advice which you hear from the teachers of the industry at this convention, and if you follow the advice of the best men, and follow the best methods in this industry, you are sure to be successful. Let me close with an illustration. I was up in East Nissouri some months ago, and visited the home of an old friend of mine, John Henderson. He took me out to the barn and showed me a sight that many people would not altogether delight in. They would think it rather strange if they were taken out to see what the old man showed me with a considerable amount of pride. What was it? It supplied me with a text. It supplied me with food for thought on my way home. He showed me an old sow and a litter of eleven pigs, and I asked him how much the old one was worth and he amazed me by saying $50, and that the youngsters were worth $3 apiece. I said to myself, "$83 for the old one and her litter of pigs," and I said I wish I was a boy again on the farm and I would go into raising hogs. When I was a boy upon the farm one of the highest aspirations of my life then had been reached when I got a young pig and undertook to fatten it for the market, but it was a bad sort of a pig. It was one of those Canadian hogs, those built entirely for racing. It was the breed that Governor Hoard tells about in that famous story of his when the judge declared at a southern exhibition that no hog was of any use that was not built so that it could out run one of the colored inhabitants of that country. This pig of mine could out run a greyhound. I undertook to feed the animal. It seemed to get but a little sleep, but it never got fat, and when I thought of my experience trying to make money out of that pig, and when I saw this other man with a sow and a litter of eleven that were worth $83, I saw the difference between the time when I was a boy and the happy time when you farmers, young and old, can make every pig sty in the country a literal gold mine.

I came home thinking of these pigs, and thinking that I saw a guarantee for the future of this country. Just so long as you can go on raising cattle and raising hogs at a profit, making cheese and butter at a profit, so long as you can make money out of poultry, I say the future of this country is safe, because the prosperity and happiness of this country rests upon the farm and, more than that, the patriotism of our people rests in our surroundings. If we are prosperous, we are happy. If we are prosperous and happy I think we are more patriotic than if we were miserable. So I say, your prosperity not only leads to your comfort and your happiness, but enhances your love of the country in which you live, and increases the patriotism of the country.

SUUMMER CREAMERIES.

By Aaron Wenger, Ayton.

The subject for which I am billed is Summer Creameries, which means creameries that are operated during the summer. There are two kinds of creameries operated in this country, one designated cream-gathering stations, and the creameries in which the milk is drawn to the station and separated by machinery. The subject upon which I am to speak is cream-gathering stations; that is where the far-

mers separate the cream and send it to the creamery, and it is a subject with which I am most familiar; that is the way in which I conduct my business. Mr. Derbyshire and Mr. Pattullo each claim the honor of having the first cheese factory in their neighborhood, and I claim the honor of having the first butter factory in Ontario on the cream-gathering or any other system. I believe the Ayton factory is the oldest in Ontario; some twenty or twenty-one years ago it started as a whole milk factory, the farmers brought the milk in and the cream was raised by the system of gravitation and the butter made from it; the farmers valued the skim milk very highly, and as a consequence that system did not live very long. Then the deep shot-gun can was introduced, by which the farmers put the milk into the can and put it in cold water, and when the cream had risen took it off, and that was the system adopted in the cream-gathering stations until the separators were introduced, and it is the system that is adopted now where the herds are small. Where the herds are large it may not be the best system, but it fills the gap in mixed farming where they do not keep a great many cows.

I do not intend to follow the subject for any length of time, and I will ask Mr. Smith to take my place, he is familiar with this work and will be able to address you fully on the subject.

SUMMER CREAMERIES.

By Archibald Smith, Superintendent Western Dairy School, Strathroy.

In assisting Mr. Wenger in discussing this subject I may say that it is not my intention to deliver any lengthy address, because I do not think the best interests of the Association are served in that way. I think if we made our addresses shorter and more practical, leaving more time for discussion, that the makers in attendance would derive more benefit. If I am able to offer you a few suggestions in relation to these summer creameries that will serve as a basis for discussion I will be pleased.

About two-thirds of the creameries in western Ontario are operated on the cream-gathering system, and they turn out about four-fifths of the whole amount of butter manufactured. We have creameries in this system that are daily producing from 2,000 to 3,500 pounds of butter, and the system is growing in this country at the present time. All through the northern country we find the smaller cheese factories and some of the larger ones being changed into cream-gathering creameries. In that country the farmers go into stock raising extensively and not so much into the dairying, and we find that the cream-gathering creamery is about the only system that can be satisfactorily operated for any great length of time.

Canadian butter enjoys a very good reputation on the British markets, but there is still a great deal of room for improvement. We are not yet getting the highest price that is paid for the best butter from Denmark. The Danes are getting more for their butter than we are getting, a difference of enough to keep all the farmers' cows in Canada during the summer months, and that is too great a difference for the dairymen of Canada to allow to exist. It need not be and it should not be. There is no reason why we should not produce as good a quality of butter as they do, and if we improve in the next few years to the same extent as we have in the past few years there is no doubt that we will not only equal them, but I see no reason why we should not excel them. The greater portion of our butter finds its way to the markets in Great Britain, and all butter for that market must be of a very uniform quality, it must contain very little salt and be free from excessive moisture, and in order to have butter of that description we must manufacture in large quantities: in other words, it must be manufactured on the creamery system. Take the butter that is at present exported from Russia and Siberia, countries that had never been known to produce butter before, they are now producing it in very large quantities, and it is sometimes equal to the quality of Canadian butter and sells for a price almost equal to that of ours. They are shipping more butter from Australia, New Zealand, Argentine Re-

public and the United States, and in order that we may hold our position on the market against these competitors we must improve our goods.

We find it difficult in the creameries, as well as in the cheese factories, to get the farmers to take as deep an interest in this work as they should and to take proper care of their cream. If one patron's cream is of bad flavor or sour, it will impart that flavor to all the other, and if we have a few careless farmers producing poor cream they injure the rest of the patrons. The success of any creamery or cheese factory will depend upon the financial returns to the patrons, and these returns will be determined almost entirely by the quality of the raw material, provided you have a well-equipped factory and a good maker; so you see the farmers have it in their own hands to improve the quality of the goods and promote our reputation. At the Pan-American Exposition we made a fairly good showing with our butter. There was a very small number of creameries represented as compared with the number we have in operation. Those who did exhibit sent butter of a very good quality. There were only one or two States in the Union that excelled us. I think the improvement in the quality of our goods at the Pan-American is the result of education and the educational facilities provided the butter makers and patrons, and also the large amount of literature on this subject that has been distributed by the Government.

I would just like to say a word here in reference to the improved condition of our creameries. There is vast room for improvement in this respect. I would suggest that you would add to the appearance of your buildings by painting the interior and exterior, which can be done for very little money; and I would suggest that instead of using expensive paints or experimenting with whitewash, that you take a good quality of cement, mix it with skim milk, or buttermilk, to the consistency of ordinary paint, and you can put that on with the sprayer or whitewash brush and I know of no paint that will last for as long or that is quite as economical, you can paint your whole building, inside and out, for less than $2. You can make it whatever color you wish by adding coloring matter to it.

I think the time is near at hand when we will have a greater number of creameries under one man's supervision. By doing so you can get a greater uniformity in the quality of the butter, and you will get a better price, and that will mean a greater revenue to the farmers. You will be able to buy your supplies in larger quantities and for less money. I think one of the principal factors in improving the butter at the cream-gathering creameries is a more universal use of hand separators. I think the manufacturers of hand separators will play a most important part in improving the quality of our butter; first, by the immense amount of literature they are distributing on this subject, and through their agents canvassing the farmers for the purpose of selling machines. In some cases the hand separators, instead of being a benefit, have been an injury in this way; the cream should be cooled immediately after it is skimmed to prevent the development of lactic acid, and to prevent it from souring. Where you mix the warm cream with the cold cream it sours very rapidly, and if we are to get the best results from these hand separators we must cool the cream immediately after it is separated. It is more difficult to reach the farmers in connection with these creameries than it is in connection with the cheese factories, for the reason that they are spread over a larger district. We have small factories where from four to five hundred farmers send their cream and it is a most difficult matter to reach them all. This year meetings were held at a number of factories, which were a great success. They held meetings at different points in the territory so as to reach all the farmers. This year we are preparing a bulletin at the Western Dairy School especially on this subject, and we will have it ready for distribution early in the spring.

The cream-gatherer should be a man of intelligence and capable of discussing with the farmers the requirements of the market, and the best methods of caring for the cream and milk, and he should be honest in rejecting all cream that is defective and will not produce the best quality of butter. The tests seem to trouble the farmers more than the price of butter. They cannot understand why the tests should vary to such an extent from day to day. Cream is simply fat mixed with skim milk,

and the more skim milk you have in the cream the lower it will test. The separator man comes along and tells the farmer that if he buys a separator his cream would be uniform all the time, but when they run the separators at a greater rate of speed than they should be run they do not make a proper separation, and they find the same trouble as before. Both the speed of the bowl and the temperature of the milk go to affect the quality of the cream.

The cream should be thoroughly mixed before it is sampled, and the sample taken should represent the quality of the whole amount, and if you cannot get all the cream in one vessel then put it in two vessels and take separate samples of each of them. Sometimes the buttermaker does not handle his tests properly and does not ripen them before testing them, and very frequently the butter makers are to blame for the variation of the tests. When the samples are delivered at the factory by the cream gatherer they should be placed in a warm room which will be favorable for the development of the acid, and get them in good condition for churning. I believe it is advisable to loosen the corks so as to allow fresh air to get in to assist in the ripening. I think the butter makers should understand the ripening of cream better than they do at the present time, in order to get the best results. In some creameries they have from five to fifteen vats, and the man who is capable of ripening all this cream uniformly is certainly an expert. We ripen the cream for the purpose of developing flavor in the butter, and for giving it better keeping qualities, and also to enable us to get more exhaustive churnings and more butter from the cream.

I very strongly advocate the use of the alkaline test. That test should be used in every factory. Cream containing different percentages of fat will require to have different amounts of acid developed in them. I have prepared a table showing the amount of acid required to be developed in cream contaning the different amounts of fat, which will be very useful. Frequently in these creameries in the hot weather the cream is delivered in a condition ready to churn, sometimes containing too much acid. Sometimes we have to hold it over to the next morning, and the flavor is then spoiled on account of the development of too much acid, and to prevent this we find a very effective means is adding salt to this cream. When your cream comes in with sufficient acid or too much acid developed you cannot churn it at once, and the best means of handling it is to reduce the temperature as quickly as possible and add salt to prevent the development of further acid. That is a very cheap way of doing it, and there is no danger of injuring the quality of the butter in that way. In reference to collecting this cream some use large tanks and others use cans. For my part I favor the use of the cream tanks, because you can hold your cream at a more even temperature. I would also advise the building of ice boxes so that after the cream is put into the tanks the temperature will lower instead of raise. By wrapping the ice up in a piece of flannel you will be able to keep it all right till the morning. The greatest disadvantage in the tanks is that all the cream is mixed, and if one or two patrons are careless the bad flavor will be imparted to the whole lot.

The question of temperature at churning is a most important one. We find in these creameries we have usually to churn at far too high a temperature for good butter, simply because the cream is thin. Too high a temperature means butter too soft, and containing too much moisture, and butter without sufficient body to enable you to work it sufficiently without injuring the grain. The color is also usually pale and the high temperature causes an enormous loss of fat, and the lower the temperature of churning the more exhaustive is the churning. The size of the granules is also of some importance. We find that the larger the granules the poorer the keeping quality of the butter.

Now the salting and the working is of some importance, and we find as a rule that the butter is salted just a little too heavily. Years ago they used to salt the butter heavily because they kept it in warm rooms; at the present time we find that the market demands a better flavor, which means less salt, and we must have cold storage. We work butter for the purpose of salting it and for the purpose of expelling moisture, and the butter maker should know when it is worked sufficiently.

The system of working for a certain number of revolutions or for a certain time is altogether wrong. This past year we have received some complaints from the old country with reference to mould. Mould is usually caused by using boxes too green or improperly paraffined or not filled properly, or by putting butter in rooms that are too warm, or by not properly soaking the linings in salt brine or formalin. By experiments carried on in the United States they have proved that salt brine has an equal effect in preventing growth of mould as has that other stronger chemical solution. Now, if we are going to improve the quality of the butter we must make a drier butter with better keeping qualities. In order to do that we must have the cream richer and churn it at a lower temperature.

In reference to salting, we find there is a demand for saltless butter, and we find the less salt you use the more working you must give your butter. Saltless butter will stand double as much working to get it in the right condition as will butter that is salted properly. The more salt you have the less work your butter will require.

I advocate a system of selling regularly. We have not cold storage in our creameries suitable for holding butter; there are few of them where the temperature can be maintained under 36 degrees or 38 degrees. If you cannot maintain that temperature you should ship it out every week or every two weeks. If you go through these large creameries in the north you will see hundreds of packages of butter spoiled before they are ready to market simply by being held in these warm storages, and that is the fault of the salesmen at the factories. I had occasion some time ago to visit a cheese factory, and we figured out the amount of money received by the patrons for the past fourteen years, per hundred pounds of milk, and it averaged just a fraction over seven cents per hundred pounds for the past fourteen years. Now, then, you farmers who own cows that are producing three thousand pounds of milk per year, and if it is costing you twenty or thirty dollars a year to keep that cow, figure your profit from that standpoint, and you will find you must improve your herds and get better cows that produce more milk.

There is one other matter I want to refer to. We have a great number of farmers making butter at home, and I think that system should be discouraged by all possible means. Not that good butter cannot be made by that system, but what I claim is that if you have twenty or thirty farmers in this district making their butter in that way you will have as many different kinds of butter, and no buyer is able to get any large quantity of uniform butter, and we can never hope to raise the standard or quality or raise the price of our goods by making butter on the home dairy system. And these farmers are only enabled to make butter at home for the reason that their neighbors are patronizing the cheese factories or the creameries and their goods are exported from this country. If the immense quantity of butter that is shipped from this country was all put on the market, as it used to be years ago, the price would be so low that you could not engage in the business. I even go so far as to claim that the money being spent at the present time through the channels of Farmers' Institutes and travelling inspectors in educating these farmers as to how to make butter at home, more especially in the districts where factories are organized, could be much better spent in teaching these farmers the profits and advantages of creameries, and that would be more effective in improving the quality of the goods and increasing the revenue of the farmers.

We find that the authorities of towns and cities find it necessary to maintain a very strict supervision over the dairies furnishing milk to the citizens in order to protect the health of the consumers of milk, and I ask why it is not just as necessary to maintain the same supervision over the dairies supplying milk and cream to our factories, in order to prevent the milk from becoming contaminated at home? It would improve the quality of our goods and increase the price and the revenue to the farmers.

A Member: What is the best feed to give cows? We have had a great deal of trouble with turnips; some farmers will persist upon feeding turnips.

Mr. Smith : Some of you already know my views on that question. While I think turnips are excellent for young stock and dry stock, they should not be fed to dairy cattle. Some farmers say they feed turnips to cows and they cannot smell it, they have become so accustomed to the smell of turnips that they lose their sense of smell in that particular regard.

Mr. McFarlane : I suppose you do not know how to feed turnips. I will tell you how to feed turnips.

Mr. McLeod : I do not think we want to know anything about how to feed turnips. I would like to ask you if you have had any experience with testing cream with the Babcock test and the oil test.

Mr. Smith : We have discarded the oil test and replaced it with the Babcock test, and instead of measuring by inches they weigh it and take a sample. I am not prepared to advocate doing away with the oil test, because it has given good satisfaction and answers the purpose; yet I think the time will come when we get more skilled gatherers and better educated makers and then I think the Babcock test will replace the oil test.

Mr. Wenger : I find that near London there are a number of farmers who have hand separators, and who are making butter and putting it up like creamery butter, and selling it at 17 and 18 cents when it should be sold at 21 and 22 cents. If you want to sell your butter as creamery butter patronize the creamery, and if you want to sell your butter as creamery sell it in a fair way. You will never build up an industry in this country by fraud. (Applause.)

CONTINUOUS PASTEURIZATION OF MILK FOR BUTTER-MAKING.

By Prof. F. C. Harrison, Bacteriologist O.A.C., Guelph.

In March, April and May of last year the dairying and bacteriological departments of the Agricultural College together completed some work on the pasteurization of milk, and I desire at this time to present to you only the data which more particularly refers to the bacteriological side of the question, and the reason why we should pasteurize at certain temperatures. During the last five or six years this has become a very keen question. You may have noticed from the dairy literature that the Danes pasteurize about 95 per cent. of their butter, and if such a leading dairy nation as the Danes think it advisable to pasteurize the butter there it would be a benefit to use to enter into this method of preparing milk or cream for butter-making.

Pasteurization may be regarded in two different ways, I think, from the standpoint of the milk dealers and also with regard to the standpoint of butter-making, and I wish to discuss it in reference to pasteurization with continuous delivery machines. The experiments were as follows : Milk was pasteurized in continuous delivery machines at different temperatures of 140 degrees, 160 degrees, 185 degrees and 195 degrees. The interest in the bacteriological department was to note the number and amount of bacteria that were left in the milk at these temperatures compared with the number in the original samples. During six months and also during the winter we find that the number and character of the bacteria in the milk is very great and very bad, much more so in the winter than in the summer, so that we are more liable to have a bad infection in winter than in the summer. The reason is that the stables are very often close, badly ventilated and dirty, and that the germs from particles of manure or from straw or hay fodder, or any other dusty fodder that may be used, contain a large number of bacteria, and every movement in the barn causes a larger or smaller number of these undesirable bacteria to get into the milk, and there they find the best conditions for development. You may have been told how these bacteria increase, and this increase very often takes place in about half an hour. If we started with a single germ at the beginning of an hour, at the end of half an hour we would have two, at the end of an hour and a half eight, and so on, and you will

find that at the end of twenty-four hours you will have between sixteen and seventeen millions and thus they go on reproducing. These charts show you the number of bacteria that are alive in the milk when pasteurized at the different temperatures. Pasteurized at 140 degrees F. there were 15,776 bacteria per cubic centimetre (16 drops), and frequently these bacteria are of a very desirable character. Pasteurization not only kills the injurious forms but kills the beneficial; in fact the lactic acid germs are the first to succumb. In pasteurization we destroy both the good and the bad in order that we may subsequently put into the milk a good starter.

The comparison has often been made between the farmer and the dairyman, which explains the chief reason for pasteurization. The farmer cultivates his land and prepares his soil for the special crops he intends to grow; he eradicates as far as possible all weeds, and he selects with care a good variety of seed, from which he expects to reap as he has sown. The dairyman also prepares his soil, the raw milk, by heating it to such a temperature as will kill all or the greater number of bacteria which may be present, these being his weeds; then he seeds his milk with a selected variety of micro-organism found to produce a good flavor in butter, and he also expects to reap even as he has sown. These two points, first, the preparation of the milk by pasteurization, and, secondly, the seeding with selected races of bacteria, have enabled all makers to secure the great desideratum, uniformity of product, which is of such importance to both producers and consumers.

In adition to this uniformity the butter-maker is incidentally able to drive off certain unpleasant odors that may be present in the milk supplied to him, and the keeping quality of his product is thereby increased, because he has killed the larger number of the harmful bacteria, which, if they had remained living, might have impaired the quality of his butter.

We find that 140 degrees is too low a temperature to pasteurize, and these germs will go on developing, and the next temperature we pasteurized at was 160 degrees, and you will immediately see the greater efficiency of that temperature; and there are some 321 bacteria per cubic centimetre left after the pasteurizing at that temperature. The next temperature was 185 degrees, and there are but 80 germs left per cubic centimetre, and that temperature of 185 degrees had also been found to kill the tuberculosis germs in milk. These are the germs which produce consumption either in man or animals, and this temperature has been found to kill the bacillus tuberculosis, the most resistant disease-producing germ found in milk; so that in addition to the greater purity that we have in pasteurizing at this temperature we also have added comfort and security from the knowledge that all disease-producing bacteria is killed at this temperature.

Summary.

1. Milk as ordinarily delivered at a creamery, may be successfully pasteurized. The milk used in these experiments was largely furnished by patrons who had but ordinary facilities for taking care of it. In the winter we receive our milk but three times a week; in summer it is delivered daily.

2. On but two occasions was the acidity of the milk over .2 per cent. The acidity averaged about .17 per cent. There is danger of the milk coagulating when heated, if it contains more than .2 per cent. of acidity.

3. It was noticed that the lots heated from 185 degreees to 195 degrees produced more foam than those heated to the lower temperatures of 140 degrees to 160 degrees. This was most noticeable in the samples heated to 195 degrees. At 185 degrees, the foam was not sufficient to cause much trouble in handling.

4. By cooling the skim milk with water to a temperature of about 65 degrees immediately after it comes from the separator, we were able to return it to the patrons in excellent condition for feeding, even in hot weather.

5. The use of 10 or 15 per cent. of culture in the pasteurized cream enabled us to ripen the cream without any difficulty. The culture used was a lactic acid bacillus.

6. Pasteurization of milk at 185 degrees and the use of a pure culture is the best method of securing uniformity, keeping quality, and the mild flavor requisite for export butter.

7. The cooked flavor which was present in the butter made from milk heated from 185 degrees to 195 degrees, usually disappeared at the end of about two weeks. In one or two lots, heated to 195 degrees, the cooked flavor remained for some time. There is apparently no danger of cooked flavors on butter made from milk pasteurized at 185 degrees at the end of two weeks, or by the time it would reach the British markets.

8. The species of bacteria present in the milk when the animals were kept in the stable, were very undesirable. Many putrefactive and fecal bacteria were present, hence the necessity of keeping the stable walls and rafters well cleaned. A good coat of white-wash increases the amount of light, and gives a general clean effect to the stables.

9. The average number of bacteria per cubic centimetre (16 drops) found in milk pasteurized at 140 degrees F. was 631,046 and 160 degrees F. was 12,848, at 185 degrees F. was 81, and was at 195 degrees F. was 40.

PASTEURIZING AS APPLIED TO BUTTER-MAKING.

Mr. J. A. Ruddick, Chief of Dairy Division, Ottawa, delivered an address on the above subject, a report of which appears on Page 72 of the report of the Eastern Dairymen's Association.

Mr. Woolley : Which is the best pasteurizing machine ?

Mr. Ruddick : There are at least three machines that are in use in this country that do excellent work, and I am not at all afraid of mentioning them. There is the Reid, the Lister, and a machine made in Denmark, which has been used in this country to some extent. Any one of these machines will do excellent work. The Lister was really copied from the Danish machine.

J. H. Woolley : Can the creamery be run on a successful basis with hand separators in a territory sending cream to the creamery ?

Mr. Ruddick: I think it can. I happen to have charge of some twenty creameries in the Northwest Territories, which are all operated on that basis. That system has been adopted there, because there is no other system possible. The cream is, in some cases, brought forty miles, and we have no difficulty in operating these creameries successfully. I think we get as good prices for the butter as has been received anywhere in Canada. The trouble is, that where that system is adopted there is a tendency to keep the cream at the farm too long. It is easier to deliver the cream sweet than it is the milk. By the use of a cooling appliance to cool the cream there should be no difficulty in delivering it to the creameries sweet, and so that the butter-maker has full control of the ripening.

Mr. McLeod : Does pasteurizing the cream improve the quality of the butter ?

Mr. Ruddick : That is the object.

A Member : What difference would it make in using the alkaline test, as to the amount of acid before pasteurizing and after ?

Mr. Ruddick : The cream must reach that stage when it becomes thick ; that is really the curdling stage. You cannot pasteurize it successfully till after that stage is reached. We pasteurize about four-tenths of one per cent. to six-tenths. I am having quite a long series of experiments conducted on that point just at the present time. There is no difficulty about pasteurizing ripened cream, but just whether it is better to pasteurize and kill the germ or churn at once or to keep the cream for some time, we are not yet decided upon that point.

Mr. McLeod : I have been running a creamery on the separator principle this last summer, and have gone into the cream-gathering business, and I have come to the conclusion that pasteurized gathered cream was the only way of making a good quality of butter that will be suitable to put on the market for export or for keeping in storage.

We have been pasteurizing for the last couple of months, and I am feeling my way because I have not got any data to go by. The information Prof. Harrison has given here about temperature is entirely new to me, because I was under the impression that if we heated our cream more than 160 degrees it would be apt to have a cooked flavor, and I was also under the impression that we were destroying very much more of the bacteria at 160 degrees than Prof. Harrison represents. It is safe to heat it to 185 degrees, and that gives better results, I would like to do so. I would like to go as high as it is possible to go with safety, and then use the alkaline test to know exactly what amount of acid has gathered in the cream. I tried at five cubic centimetres of acid, and I find the inside of the pasteurizer is very much coated with casein or curd, and at seven or nine cubic centimetres, the casein is washed out clean.

THE LOSS OF CASEIN AND FAT SUSTAINED BY WASHING CURDS.

By Prof. R. Harcourt, Chemist, O.A.C., Guelph.

With reference to the question of the pasteurization of milk, I may say that a bulletin has been issued by the Agricultural College (No. 117) which deals with the whole question of pasteurizing milk.

For some time past much interest has been manifested in the question of the advisability of washing tainted curds, and the consequent effect upon the quantity and quality of the cheese. Some makers wash every curd, just after milling, whether tainted or not, claiming that they produce thereby cheese with better texture and a more even flavor; others are afraid even to wash a badly tainted curd, for fear of removing too much acid. To my mind, it is evident that washing curds will do two things: First, remove some of the bad flavors; and, second, decrease the amount of acid. It has been fairly well established that tainted curds are improved by washing, and that very fast working curds can be made into salable cheese by washing immediately after dipping. Indeed, in many cases, washing has been the means of saving many vats of over-ripe Monday morning's milk. In such cases, the water washes out much of the excess acid, and at the same time assists in cooking the curd. Some makers have hesitated to practise washing for fear of removing too much acid. Neither theory nor practice will confirm this. Warm water poured over the freshly cut curd only washes the surface and carries away acid and taints that may be adhering to it. It is impossible for the washing to remove all the acid, for the water cannot penetrate the cubes of curd. Even if the amount of acid is very much decreased, it very quickly develops again from sugar in the curd. Experience has shown that washed and unwashed curds are usually ready for the press in about the same length of time.

Recently it has been reported that cheese made from tainted curds which have been washed have developed their peculiar flavor when kept for some time. It is evident that washing does not go to the root of the matter and remove the cause of the flavor; consequently, it is quite possible that the report may be true. But on this point, I am not prepared to pass judgment.

It has also been reported that washed-curd cheese has afterwards developed rough open texture. Possibly this may be due to salting too soon. Washing the curds tend to make them feel smoother and more mellow; and, if salted when they have the same feel as an unwashed curd, they are very likely to be salted too soon.

Experiments have proved what most cheese-makers have thought to be true, that is, that washing the curd must remove something besides acid and taint, and thus decrease the yield of cheese; but just what this loss is made up of is not known. The object of the experiment, the results of which I am going to present to you, was to ascertain what this loss consisted of, and where the greatest loss occurs.

The plan of the experiment was as follows: 800 pounds of milk was treated in the ordinary way until just after milling, when the curd was evenly divided and piled in the little experimental vats used in the Dairy School. Approximately, the curd was

piled to about the same depth as in the ordinary work in a cheese factory. One lot of curd was washed with as many pounds of water at 98 degrees F. as there were pounds of curd; and the other was worked along unwashed. All the drippings, including the wash-water in the case of the washed curd, from both vats were collected, and the percentage of casein (N. x 6.25) and fat determined in them. From the weight of the drippings and the percentages of casein and fat, the amounts of these two substances which had drained away from the curd were determined.

In order to ascertain where the greatest loss resulting from the washing occurs, we collected separately the drippings from milling to salting and from salting to taking from the press. The old upright press was used so as to press the cheese separately. The losses occurring during these two periods, which are given in the following table, are the averages of a number of determinations and not the results of a single experiment.

Losses in *Grams per 1,000 Pounds of Milk.

	Before salting.		After salting.		Total.	Per cent. of moisture.	Per cent. acid.	
	Casein.	Fat.	Casein.	Fat.			At milling.	At salting.
Normal	12.3	25.3	70.6	54.1	162.3	32.4	0.93	1.24
Washed	84.4	251.0	49.1	36.6	421.1	32.5	0.98	1.04

* 1 lb.=453 grams.

It will be noticed that before salting the greatest loss of both casein and fat occurs with the washed curd, but that after salting the normal or unwashed portion lost the most. It is quite evident that the washing has carried away considerable casein and fat that was adhering to the freshly cut surfaces, just as it might be expected to do. It is equally evident, though, that it is impossible for the wash water to carry away all the taints or to remove the cause of the taint. With the normal curds there was a greater loss of fat in the press boards. The loss due to the washing, however, is small. Prof. Dean's experiments show it to be 1.1 pounds of cheese per 1,000 pounds of milk. The results, as given, figuring the casein and fat as two-fifths of the cheese, account for a little less than a pound of cheese for the same amount of milk.

Regarding the amount of moisture in the cheese, we could find very little difference between the cheese made from the washed and unwashed curds.

As the curd was divided after milling, the amount of acid present was the same prior to the washing. At the time the curds were salted there was 2 per cent. more acid in the drippings from the normal curd. This may be due to the washing away of acid, or, what is more likely, to a dilution of the acid by the water used in washing. At any rate, by the time the cheese was taken from the press, there was as much acid present in one as in the other.

These experiments show, what might be expected, that the greatest loss due to washing occurs at the time of washing, and that, at that stage of the process of manufacture, there is very little danger of removing too much acid.

Regarding the effect on quality, which is really outside the province of this paper, I may say that Prof. Dean's experiments, conducted during the past two seasons, with a large number of vats of milk, all go to show that there is no increase in quality of the cheese when the milk is of fair quality. There is no doubt, though, that with over-ripe milk, such as is often received at cheese factories on Monday mornings, washing is beneficial in removing the excess of acid and in helping to "firm up" the curd. What the loss of casein and fat is at this stage has not been determined; but time and again makers have been able to handle such milk successfully by leaving the curd as long as possible in the whey, and then washing

out the excess of acid, and here I have no doubt the improvement in quality will fully compensate for the loss in quantity.

COLD STORAGE TRANSPORTATION.

Mr. Wright, of the British Refrigerator Company, was invited to speak, and said: It gives me great pleasure indeed to be present at this convention. I had the pleasure of being at Whitby, listening to discussions there on these very important matters, and I find that a world of information is derived from attending these meetings and listening to these discussions. Your President has asked me to say a few words in relation to mechanical refrigerating, a subject upon which I can speak with some degree of authority, as I may claim the title of being the oldest refrigerating engineer in the country, and associated with the only company that is exclusively devoted to the manufacture and supply of that class of machinery. There seems to be some misapprehension with relation to the effect of mechanical refrigerating, with regard to the curing of cheese. I feel that if the gentlemen who addressed you on this subject looked more carefully into the matter they might have found that these difficulties, which they appear to have observed, really do not exist.

There is refrigeration and refrigeration. There are three principal methods in operation at present. There is what is known as the brine circulation system, the direct expansion system, and, the later and most scientific of all, the cold air system. It would not be practical in the short time at my disposal to enter into a discussion of these various methods. I suppose you have a general idea of the principles involved, and will say that both the brine circulation system and the direct expansion system work on the same method as is employed in heating a building, that is, pipes are put through the rooms in which the cold air is circulated the same as you circulate warm water to heat rooms. With the cold air system the principle is entirely different. There are no pipes located in the chambers whatever. The air is exhausted from the rooms, passes over specially designed coolers and returns back to the chambers. These coolers are composed of ammonia coils; that is, ammonia is the refrigerant employed, and is the medium that produces the cold.

Over these coils is circulated, by means of a pump, a continual spray of cold brine, and the air that is circulated through these coolers becomes thoroughly washed, in fact to a very considerable degree sterilized and is returned to the room almost pure and sweet.

The very important question of moisture is one that is engaging the attention not only of this convention but also that of the meeting at Whitby. The statement was made upon the platform yesterday by Prof. Dean that he was informed by a gentleman in Boston that curing cheese by means of mechanical refrigerating had not been successful. If you will permit me, I will try to explain why this was the case. We have not yet introduced the cold air system to any considerable extent in the United States; we have been operating it here for the past seven years, and we are just introducing it to our American friends now. The capacity of the air for moisture is determined entirely by the temperature; that is, the lower the temperature the less moisture the air will contain. If we have a number of pipes in a room, and that room closd up for twelve hours, the refrigerant that is in these pipes, whether it be ammonia or brine, will necessarily be very much lower in temperature than the regular temperature of the room, and the consequence is that you cannot have an equal temperature in the room.

The air that circulates through the room, coming into contact with the pipes, which are of a lower temperature, falls to the floor, and the warm air takes its place, and the result is that the moisture contained in that small thin strata of air is taken down, and in the course of a few hours all the moisture would be deposited in the form of snow or ice upon these pipes; consequently the hydroscopic conditions of the atmosphere of the room will be far below the normal point. We are told by the

authorities that the best results were where the temperature was about 75 per cent. saturation.

With the cold air system these difficulties do not occur because the cold air, in passing through the brine, parts only with the moisture it contains down to the temperature of the brine, and consequently you can retain in your curing rooms the hydroscopic conditions of the air at whatever point you desire.

Not wishing to take up your time unduly I will just add a word with relation to the isolation on board ships. The difficulty with cheese and butter on board ship has been a lack of proper ventilation. Of course you know they have not much room at their disposal; consequently it becomes a very much more complicated problem to solve.

The matter was referred to us by Mr. Robertson, and we took it up, with the result that we advised the brine cooler, by means of which a very much larger space than we had ever before attempted in the matter of refrigeration was accomplished; that is, we did not require to insulate the room so thoroughly.

Isolation is a very important matter in the cold chamber, and every inch you take away from the side of a vessel is a very important matter for the owner. The problem presented to us was how to give us a temperature of about 60 degrees and not encroach unduly upon the cargo space. I am pleased to say that we were successful in accomplishing that, and I have been informed that word has been received from the dealers on the other side that all the cheese sent over in these refrigerating chambers was received in the best possible condition, and they would advise all cheese and butter to be sent forward in that way.

The Chairman: This subject has become such an important one now, and especially the latter portion of it, namely, refrigeration on board steamers, that it is a subject I would like taken up in the form of a resolution at the close of this afternoon's session. As Mr. Wright will tell you, the accommodation that has been provided on ships is a very limited accommodation. The demand for it is considerably in excess of the accommodation. The people who have used it are delighted with the results. The cheese that have been shipped in these cold chambers have arrived in splendid condition for the market, have lost less in weight, and have been in such condition that our customers on the other side insisted upon the cheese coming in these ships if possible, and I feel that it is in our interest as dairymen to memorialize the Government, asking them to give us increased accommodation on ships at sea. The ship owners will not provide it entirely at their own expense, and we have to look to the Government to get the ship owners to provide accommodation.

Mr. Ruddick: In connection with this matter of providing cool chambers on ships, I think I am justified in saying that the Minister of Agriculture, the Hon. Sydney Fisher, has intimated that he hopes to have at least twenty-five steamers fitted with such service during the coming summer. (Applause.) That would make a very great deal of difference in carrying our cheese to the old country markets. I am not able to state that positively, but he and Professor Robertson hope they will have that accommodation, and I am sure that any resolution, coming from such an important body as this Dairymen's Convention, would have a very considerable effect.

Mr. Derbyshire: We have passed a resolution in the east, thanking the Minister for what he has done, and showing him the good results that have been accomplished by what he has done; but urging him to have every ship that leaves Montreal, carrying butter and cheese, fitted up in that way. We want the very best service in this country. The Government is ready to do it if we ask for it.

The Chairman: I am exceedingly pleased to hear what Mr. Ruddick says. One of the greatest difficulties we are likely to meet with is this, that to the ports of London and Bristol the ships carry immense cargoes, and the space, as it is provided, will accommodate about six or seven thousand boxes only, so that frequently only one-fourth of the cheese that would be in these ships would have cold storage accommodation and three-fourths of it would have to go in other storage. So you see we want increased storage on those provided at present. We want a lot of cheese stored on the Bristol

and London boats. We want refrigerator cars from the point of shipment in the country to the seaboard, as it is at present you cannot get it. The railway companies have not sufficient ice stored to ice the cars, and if they are iced at the points where they can be iced, and then shipped up the country forty or fifty miles to be loaded, by the time the cheese is in the car the ice is melted. The ice is not handled the way it should be; there should be icing stations in different parts of the country, and the cars iced at these points. We realize more and more that the cheese industry suffers more from heat than anything else. If we can keep the cheese at a cool temperature all the time we would have a better reputation and the cheese would weigh more.

CREAMERY AND CHEESE FACTORY BUILDINGS.

Mr. J. A. Ruddick, Chief of Dairy Division, Ottawa, spoke upon the above named topic, taking up the same ground as that covered in his speech on this subject, to be found on page 19 of the report of the Eastern Dairymen's Convention.

Mr. Smith: If you would put a wooden floor over the cement, would you leave an air space?

Mr. Ruddick: I would have that space filled with some material. In building a refrigerator, the best finish I know of for the inside is a coat of shellac. It hardens quickly, and there is no smell from it. It makes the best finish for the inside, and the wood will not absorb moisture, and it is easily cleaned. The one of all advantages we have in our creamery refrigerators is to keep them sweet and clean. There should be an ante-room, so that when the door is opened it will not let the warm air in so rapidly.

Mr. W. E. Wilson: Is there any trouble from mould in a basement curing room?

Mr. Ruddick: There is a question of moisture. If the room is so constructed that the moisture gets into it there will be trouble in that way. I think one way in which a basement curing room might have a good deal of moisture is because a basement curing room is cooler than the outside air, and if the walls and windows are not made tight the warm air will carry the moisture with it. You should prevent the air from getting in from the outside; you should have double windows and double doors, and they should fit tight.

Mr. Wenger: Make your sash double: have glass on each side, and you will have an air space and will still have the same light.

THE MARKETING OF CHEESE AND BUTTER.

By Andrew Pattullo, M.P.P., Woodstock.

One would suppose that a man who runs a newspaper and who had a few other things in this world to attend to had trouble enough on his hands without having given to him a subject of this sort. The other day, when I saw this subject with my name attached to it, I said to myself, "An enemy has done this," or if not an enemy, some jocular friends of mine, like the President or Mr. MacLaren, who want to see me in trouble, have done it. However, if, when I get through, you do not know more about it than you did when I started, I will have this consolation, that I have seen you discussing the same problems in connection with the dairy year after year for the last twenty or thirty years, and some of these problems do not seem to be solved yet. I look upon this question as almost an unsolvable problem. It is a very difficult problem, and I do not expect to see it solved by what I say or by the discussions which may take place upon it. At the same time, I think it quite possible that the gentlemen on the platform, and many in the audience, who watch these markets as closely as I have for a great many years, should lead solely if not directly to reform. I think that quite possible. Indeed reform must come. Improvements in the managements of our cheese markets must come if we are to progress as we should. Let me correct myself by telling you that I am

not going to offer much advice. I am not going to express any dogmatic opinions in the presence of you patrons or of the buyers. I will just say a few words by way of a starter, because that is really what I am. You have heard them discussing what a starter is in the dairy business, and a professor said yesterday that he only recommended the use of a starter when he had bad material, and that is the way they are using me this afternoon.

As I have watched the antics of these buyers and of some of the salesmen on these markets I have asked myself the question: Why is it that, after a great deal of trouble, desiring to benefit the dairy industry, having started these markets believing they were for selling of cheese, it transpires that cheese boards are just places where cheese are not sold? They go and look at each other, but they do not buy or sell. They remind me sometimes of the starter at a trotting race, where the jockeys work by the hour, and where the audience is impatient, but there is this difference in favor of the race course, that the horses do get off some time, however long they may keep the audience, but these fellows never get off. (Applause.) The race between them is declared off, they leave the board and then the business is done on the curb stone or some place else where it is not seen. Now, if these cheese markets are not for the sale of cheese, why not give them up? I think it would be a great mistake to give them up, because even in their present condition they are of some advantage; for if you had not cheese boards the buyer would come and take your cheese, and you would have no information except the newspapers, which often come late, and which are sometimes delayed. Even if you do not sell your cheese at the board, they are of some value, because you can go there and find out how the market is. Why is cheese not sold upon the boards? I am not going to answer that question directly. Some of you may think we have to be very deferential to these gentlemen. I am not going to be deferential to them, and I say the reason cheese is not sold upon the cheese boards is absolutely and solely the fault of the salesmen and those behind them. That is plain enough. That may not please the gentlemen, but I say it is absolutely true; and let me tell you why I think it is true. Not that the buyers do not exercise a little influence in this, but I say the major influence and the responsibility rests with the salesmen themselves; because you have an organization there which is prepared for you, and if you want to sell your cheese on the board you can sell them on the board because you can resolve unitedly not to sell them anywhere else. If you put your heads and hands together, and put your hands upon your hearts and say, as a matter of honor, you will sell your cheese for what they will bring upon the cheese boards, what are the buyers going to do about it? They have to buy them there. But for some reason or other you pass a resolution to-day, and then you break your resolution to-morrow, and things go on just as they were, and you imagine that by private dickering on the curb stone or around town you will get more for your cheese than you will in open market; and by that means you break down the market which is your protection, and which exists especially for your benefit. If you want these markets to be run let your salesmen unite and let your cheese be sold there and in no other way. I sympathize with the salesmen. I know they are watched by the patrons of the factory very closely, and I am told there is scarcely a salesman—and it takes a long time to make a shrewd, intelligent salesman—but there is somebody else among the patrons who would like to take his place; and the less a patron contributes to the factory the more captious he is about criticizing his salesmen, so that the salesman has no easy job. Let me say this to you, if you want to protect yourselves against these critics, who are often unjust, the safest way is simply to say, "I have gone to the board, I have put my cheese up when they were ready to be sold, and I have sold to the highest bidder," and my advice on that phase of the subject is that you should sell your cheese upon the board, and sell only upon the board, and in that way you are quite sure to get the highest price that the buyers can afford to pay.

I have referred to the fact of the salesmen being criticized under the present system, and I say they are much more likely to be criticized than if they sold on the open board. Let me show you how this system affects the maker. The buyers buy your cheese, agreeing to take them, but the bargain, as you know, under the present system

is never absolutely a bargain, and it is said about our friends the buyers that they sometimes buy cheese, and they are willing to take them on their own inspection when the market is going up, but they are not willing to take them when the market is going down. I am not going to say anything that would reflect upon the buyers here, and I am not going to give these gentlemen any taffy, although I will say this, that as I have known them they are very worthy and very honest, and have done a great deal for the cheese industry. There is certainly no business or industry in this Canada of ours where there has been so little commercial fraud or commercial dishonor among the buyers which has brought injury to the farmers as there has been among the cheese buyers and the firms behind them. It is simply remarkable how little we have heard about dishonor or loss in the cheese industry of this country. There have been a few isolated instances, but going back for thirty years it should be said, to the honor of the cheese trade, that there is very little dishonor. You have been selling your cheese with absolute confidence that you would get your money and not suffer any loss. Whether the buyers are justified in rejecting your cheese is a critical point I am not going to express myself upon. When they make the assertion that your cheese is not up to the standard, how that is to be met I do not know. Whether it can be met by previous inspection I do not know. Mr. Derbyshire will tell you that to some extent this evil has been cured in Eastern Ontario by the fact that there is an official arbitrator in Montreal, where the cheese can be inspected, and if there is a dispute between the buyer and the seller his pronunciation is made upon it and that settles the matter, and I understand some cases have arisen in which the salesmen have been protected by this official at the port of Montreal; but all our cheese does not go to the port of Montreal, consequently there is a difficulty there. Whether there can be devised a system of inspection here I must leave you and the buyers to decide. I am inclined to think that if you adopt the system of previous inspection the details might be worked out. It may cost the Government of the Province or of the Dominion something to give you efficient inspection. The cheese district is a very large one, and for all the buyers to inspect all the cheese of the district before they want to buy it is to expect a good deal from them, perhaps it is to expect an impossibility, I am rather inclined to think it is; but it seems to me we ought to be able to provide machinery for inspection in a case where there is a dispute. I know these gentlemen here and yourselves are better able to judge than I am. We have three extremely competent inspectors now, and could not they be armed with the power of inspection or arbitration? But just let me warn you now with reference to some of the clamor that we have been hearing regarding this refusal of cheese. I have always felt that there was some fault to be found with the buyers, and it is this. We hear from them a great deal about the defects of quality in your cheese, and what surprises me is that they come on the cheese board and pay exactly the same for the cheese from those factories which are criticized as for the cheese made by the men who are making the very finest cheese. (Applause.) That is something that no fellow like me can understand, but we have observed it, and it has puzzled us. I believe that if these men, who know exactly what the product of the finest makers is worth, and who know exactly how much the product of some inferior makers is worth, would discriminate on the cheese board I think some of these faults would be cured.

With reference to the complaints of some of the patrons I have not much sympathy, because they do not contribute their fair quota to the making of cheese, and if the cheese is perfect I do not believe, even on a falling market, you are at all likely to find the buyers reject your cheese, and I will say that I have a great deal of sympathy for those men, on account of the risky character of the business in which they are engaged. No doubt they very often lose enormous sums of money; occasionally they make large sums of money. They are bidding on very close margins indeed, and it keeps them hustling to get anything out of cheese, and in the end I am satisfied that the patron gets all, and sometimes more than all, there is in it. I think upon the whole, the very highest price is paid by the buyers, and the whole history of the trade shows this. I think that where the buyers have made a bargain for your cheese

there are very rare instances in which they have rejected them where they were up to the mark, although there is a tendency among them to pay a little too high for their goods, and consequently there is a tendency on their part to inspect them very rigidly if the market is going against them.

We heard at Whitby, and you have heard to-day, something about the central curing stations, and it seems to me that in that way you will have a solution of this question. You have not got to the end of change and improvement in the cheese business by any means. You are learning every day you have been associated together. Why cannot you carry your co-operation a little further? You have been talked to about your curing rooms and factory buildings, and been told what an ideal building ought to be. To me it has been a matter of amazement that you make half as good cheese as you do in some of the factories you have. You have heard that it is absolutely necessary to have a uniform temperature in the curing rooms. The buildings that you have, and the means of heating that you have, make it absolutely impossible to get that uniform temperature. One part of the room is hot and the other part cool. Would it not be a great advantage for some of you men to put half a dozen factories together, and have groups of factories all over this district, and have central curing stations, which are simply cool curing rooms for your cheese, where your cheese would be collected together as soon as it is made, and cured perfectly. That would facilitate this question of selling, and would solve the question of cheese markets absolutely. Who are to put up these curing stations? I do not believe the buyers will do it; first of all, the buyers are not millionares. If they were they would get out of the business as quickly as possible. If they are acting for big firms, the big firms are not going to spend so much of their capital in buildings. But I believe the municipalities and the Local Government and the Dominion Government might be called upon in some way, and I believe these central curing rooms might be established, and it would create a spirit of emulation. It would give you an opportunity of contrasting; you would see how the cheese compared. I am strongly of the opinion that whatever your difficulties may be now, I believe the future will come through co-operation. I do not know whether these stations could be utilized for other purposes or not; I think possibly they could. When they are not in use for cheese purposes I think perhaps they could be used for some other products of the farm.

I have been asked to say what is the effect on the salesmen, on the buyer, and on the patron. I have not answered these questions directly, but rather by way of suggestion. I think the maker is included here, and let me say one word for the maker. It seems to me that he comes out of this thing at the small end. In other words, the maker is the man who, under the present conditions, has to bear the burden. In the first place he is subject to criticism by all his patrons, and he is mostly criticized by those whose criticism is least deserved. If the buyer, rightly or wrongly, runs down your cheese, of course the reputation of the maker is gone. I think the position of the cheese-maker in this country is becoming more onerous and irksome than it should be. There is such competition that they are not very well paid, and they very often have to suffer a monetary loss. You ought to save your makers, because they are all trying to do their best. They are faithful and industrious, as a class, beyond expression. So far as I know these men cannot be too highly praised. I believe the makers of this district are working hard and trying faithfully to do their duty, and relief will come to them when you solve this question, as no doubt you will. This marketing problem is very simple if only the salesmen will put their hands together and carry out their promise to sell only upon the cheese board. I think in selling your cheese you should insist upon prompter delivery than you do. The difficulty seems to be that you sell your cheese subject to the whims of the buyers, who may take it immediately, or some two weeks or a month after it is sold.

The Chairman: This is a subject upon which a great many people have a great many different views. It is a subject which is engrossing the thoughts of the people of practically all districts, and it is a subject that has brought about different practices in this section. West of Toronto the practice is the same all over. Cheese are brought

on the markets, and the buyers go and inspect them and order them to be shipped on a certain day, and as soon as he inspects them they are shipped out. At Brockville the system is that the buyer goes up and buys the cheese on the board or on the street, and the salesman ships the cheese to Montreal and the buyer never goes near the factories. They are shipped as rapidly after they are sold as they can be got ready. When they get to Montreal the buyer pays for them if they are good ; and if they are not good he has got to prove that they are not good. He must get a certificate from a Government man, and he cannot have any reduction if the salesman is not willing to give it to him. The salesman has still the right to keep them if he wants to. At Perth the cheese come in on the day of the market, and are loaded in the cars or in the freight shed. The buyer buys them, and afterwards looks at them, and if he thinks they are good he passes them out. The system in Quebec is as follows : The cheese comes down on the Montreal boat and the buyer goes down and inspects them. The man who is there to sell them may represent fifteen to forty factories. They come in by the C.P.R. and G.T.R. and different boats. He buys them and the cheese are then taken to his warehouse. If any dispute arises, and the salesman is not willing to make a reduction, the goods are still his property, and he can take them and sell them to anyone else if he chooses. In the case of the Brockville cheese and the Quebec cheese they are all grumbling. The buyer thinks he gets the worst of it, and the salesman thinks he gets the worst of it. They are all trying to solve the problem.

Mr. D. Derbyshire : I was looking over Mr. Pattullo and thinking what a cunning salesman he would be, and how quick he would take his cheese off the board, and slip round on the curb and get an eighth of a cent more for his cheese, the same as the rest of the boys. (Laughter.) Of course the cheese business is a hard question. Providing I should drop into Woodstock on a market day, and providing I did not want to buy cheese, but I knew MacLaren really had an honest order, knew that he had received cables and had already sold the cheese and had to have six or eight hundred, do you know how I could punish our dear brother that day ? I could go right on the board and bid half a cent more for the good factories that I knew were all right, and then not another box of cheese could be sold on the board that day. They would not sell them for less money and you could block any of those buyers in half a minute. Even if I did not want to buy many cheese, I could destroy every other man who wanted to do business on this board. You ought to sell every box of cheese on the board for what you can get, and if you sold them for less money to-day than they were worth, do you think the buyers in this district would allow the other fellow to take them for less than they were worth the next day. Not a bit of it. If I were buying from day to day, and if I knew when I bought I had to take the cheese, I would know something about the quality of cheese, and the factory, and the ability of the patrons who furnished the milk. All these little details I would find out, and then I would buy the cheese for what they are worth, and the result would be that the factory that did not come up to the mark would have to go out of the business. In a great many cases cheese are not sold on the board because they do not want to give away their little details of quality. I have seen 9,000 boxes sold in Brockville in fifteen minutes. The newspaper man thinks this a great idea, and it comes out in the newspaper. It would be death to the poor little factories if they were sold for what they were worth on the board. If you want to improve Woodstock and give your board a name and standing in this country, you will sell every pound of cheese on the board. You take those good factories around here, and if you sell their cheese for what they are worth you will find they are worth a plumb cent and a half a pound more than other factories. Then, why not sell them for what they are worth, and sell the poor cheese on their merits ? That will come out in the paper, and bring up discussion, and it will bring about a revolution in the factories business that no other system will ever bring. (Applause.) I know how it is. Some fellow comes in and he says, "Derbyshire, take my cheese for what they are worth." The fancy factories in our district have no trouble about inspection, and I can say we have a large number of factories, and Mr. Ballantyne has received cheese from factories that he has had absolutely no trouble with at all, while with other factories he has had trouble every time

he buys cheese from them. You do not hear the factorymen who make fancy cheese say much about inspection—everybody wants their cheese. But it is the man who makes poor cheese who does all the talking. I presume that some day we will get this problem fixed so that we will all go to glory together, cheese boards and all.

Mr. Eagle : I am not a polished speaker, but so far as shipping cheese from here to Montreal goes, a few of us have done it, and I do not think we want to repeat the experiment. It is generally understood among the salesmen west of Toronto that if a man sells his goods on the board, if cheese goes up a cent a pound you have to deliver your goods, but if it goes down a cent a pound you cannot get rid of them, and that is a question I would like to have discussed. There is an impression abroad that there is a good deal of difficulty getting rid of the cheese when the price goes down, and I would like to know whether that is true or not.

Mr. Lockhart : I am not a salesman, but I have been identified with a cheese factory for a good many years, and have had some experience in this trouble between buyers and salesmen, and I have not been very well satisfied with how things are going on. I cannot quite understand the doctrine that we should come up to the market and sell our cheese on the board, and yet when we do so they are not sold. With refereuce to almost every other department of business, a sale is a sale ; but in the cheese business it does not matter whether the buyer has any financial standing or not, or whether he is honest about it or not, the buyers can come in on the market and make a bid, and they can bid a price sufficiently high above their neighbor to get the cheese. It is marked down to them, and very often they leave it on our hands, and the companies have lost a great deal of money in this kind of way. It used to fall on the cheese-maker, but since we have got on to this trick of the trade we have sympathized with the cheese-maker and we have been disposed to distribute the trouble over the busiuess a little more. I find Mr. Pattullo is a considerable admirer of the cheese-maker and the cheese buyer, but he has not too much to say with reference to the poor patrons. As far as I can see they have simply to offer their goods and somebody bids on them. I am disposed to believe that we have honorable men as buyers and honorable men as makers, and I think we have some honor in the companies, but I see there is something wrong in this matter. If, when the cheese were put on the board and sold they were sold, I would be quite willing to sell the cheese in that way, but we have to go there and sell our cheese, and then sit down and wait till they have time to refuse them, and I do not think that is proper. I do not see why sauce for one should not be sauce for the other. We will have to get an arbitrator appointed by the Government. I do not see why you should wait until the cheese gets to Montreal. I cannot see why they cannot see what our cheese are like, and buy them and pay over the money. That is what we want, and that is business. (Applause.)

The Chairman : I know Mr. Lockhart voices the sentiments of a very large number of the cheese men of Western Ontario. I believe myself that there have been some very great injustices done by buyers. I know of some individual cases that I think were simply scandalous; but in a great majority of cases there has been real and genuine cause for the rejection of the cheese. In many cases the buyers allow too much time to elapse between the time of purchase and rejection, and if the market declines a cent the loss comes very heavily upon the man who was selling the goods. If a system of central storage could be established, so that the cheese could be examined immediately after selling, practically all the difficulty that now arises would be a thing of the past.

Mr. Brown : With regard to what Mr. Derbyshire said about blocking the market, an instance came before our board that was very parallel. I think a large portion of that trouble could be done away with if the cheese was sold, but there is no cheese sold on the market until they are inspected, and in this particular instance the market was away above the proper price. There were four factories that did not sell, and those that were sold were rejected on account of the depressed condition of the market afterwards. I think a large proportion of this trouble would he overcome if there was some definite sale, something to bind the man who is bidding. Some men will come on the market, and bid anything for the purpose of stopping somebody else from buying, and then if he

did not want the cheese when he comes to the factory he simply says there is something the matter with them, and he can not take them.

Mr. Robert Johnston : I think the whole situation is in the hands of the salesmen. They should pass rules and stick to them. I think they should insist upon the cheese being inspected before they are bought, and then the buyer would have no reason for rejecting, and he would not come to the board to buy cheese that he had not orders for. A great many buyers are simply speculating. I do not think the salesmen of the factories should be speculators, and I think that if the salesmen would get together they could make rules and conform to them, and then the buyers would have to buy according to the rules. (Applause.)

Mr. Brown : Can you find a board that will stick to the rules ?

Mr. Johnston : It is the local jealousy among the salesmen that causes the whole difficulty. Here is a man with a factory where they do not make fine goods, and he does not want to take a less price than the man who makes the finest goods. If the cheese were sold on the open board we would know who made the finest goods.

Mr. Brown : In passing rules and regulations to govern any body, unless the members stand by the rules themselves, how are you going to enforce them ?

Mr. Paget : This discussion is perhaps as interesting as any question we have had before us. After listening to all that has been said this afternoon I do not know that we are any nearer solving the matter than we were when the discussion began. There seems to me to be a difficulty somewhere, and I believe both the buyers and the salesmen are at fault. I quite agree with the statement, and I believe it is right, and I believe it is the only method by which this matter can be made right, that the first thing to do is to have the salesmen agree, and have every board throughout our country agree, to sell the cheese on the cheese board at the cheese market. I also believe the buyers ought to be in a position to buy the cheese absolutely on this board. If it is necessary, let the buyers go through the country and inspect the cheese in the factories before the day of the sale, if it cost them a sixteenth to an eight of a cent more a pound to do that work, then give the salesmen what they can afford to pay, with the understanding that the cheese is absolutely sold when they are bought at the board. I believe if the salesmen would say, "We will sell our cheese on the board, and in no other way, and the buyers must buy them absolutely on the board"—I believe, if this agreement could be arranged between buyer and seller, the difficulty could be overcome. I believe the product of some factories is worth more than others. I believe there are factories in our country to-day whose cheese are worth a cent a pound more than that of other factories. Are they getting it ? We have poor factories getting within one-sixteenth of a cent of the price paid the best factories, but their cheese are not worth within a cent a pound as much, and do not believe that is right. I think those are things that the buyer and the seller will have to come to a decision about, and I believe the first solution of the problem is that there will be an agreement on the part of every man selling cheese that they will buy them on the board, and that they will pay the market price, and that when the cheese are bought they are bought, and that the buyer should know whether the cheese is right or not before he bids on them. If this trouble continues much longer cheese boards will be abolished, and it will go back to the old hole-and-corner way ; the buyers will drive around the country to the factories and pay you a quarter to half a cent less than the cheese is worth. I believe the market is the best system. The salesmen are intelligent, and they come to the market and know what to ask for the cheese, but in the other way the buyer goes to the factory, and perhaps takes the salesman unawares, and gets the cheese for a less price.

A Member : I think we need a Government man in Western Ontario. I think when the buyer goes to the Board he should put up some money on the cheese he buys, and when he goes to the factory and inspects the cheese, if his inspection does not suit the salesman or the cheese-maker they should be able to call this Government man, and he should decide the question, and if he decides in favor of the cheese-maker, and the buyer will not take the cheese let him lose the money he has put up.

Mr. Derbyshire : At Brockville we have a number of buyers that bid any price, but nobody pays any attention to them. The salesmen want to deal with the men who have done the honest thing with them, and that is what you will have to do here. Pay no attention to the man who pays an eighth of a cent above when you know he will not deal honestly with you. I would only sell to a man who could put up the money and do business in a proper way.

Mr. Pattullo : I desire to express the satisfaction I feel in the discussion we have had. I think I deserve your thanks for drawing out some of the gentlemen on the subject, especially my friend Mr. Lockhart. I heartily agree with everything he said. The buyers are able to look after themselves, and they have the first information. I believe Mr. Johnston has brought the whole matter in a nutshell ; the key to this situation is with the salesmen, backed by the patrons. The salesmen have the whole subject in their hands. Let the salesmen come to the board and sell only only upon the board, and let them say, "We will sell to no buyer who has not inspected our cheese." What is the use of saying, "Gentlemen, be good," when they won't be good. You cannot make them good by selling to anybody who has not inspected your cheese. The salesmen here and everywhere have it in their power to kill any buyer who will violate a contract. I am very strongly in favor of the central curing stations. Some of you will say, "What will we do with our present buildings?" I should like to see this system of central curing stations carried out, and that would leave your present curing rooms for another purpose. What purpose do you think I would put them to ? I would have every one of them fitted up as lecture rooms, and as board rooms for the meeting of the patrons, and I would have you meet all the patrons of the factory every time the inspector comes around. If that were done half a dozen times during the season it would be a great benefit. (Applause.)

Mr. Lockhart : I cannot see why we have the right to ask the buyer the question whether he has inspected our cheese or not. Let him buy the cheese. He knows the reputation of the factory, and let him take them at his own risk.

A. F. MacLaren : I simply want to say what I have said a thousand times before, and that is this : The salesmen have it in their own hands. If I want to sell I sell, and I do not go to work and have the buyer come and sell me and then reject the cheese. If I were selling cheese I would compel any man I sold to to inspect the cheese before I sold it to him. There is no use discussing this thing for an hour; the situation is in your hands. You can go to work and come to this board and say, "Gentlemen, I will sell to no person except one who will make this sale final," and that should be a person who has seen the cheese before.

Mr. Woolley : When he has bought them he should pay something on them.

Mr. MacLaren : I am willing to go around the country and inspect these cheese and go to the market and take my chance. I will not pay any money down, because if I buy a cheese I will take them every time.

Mr. Lockhart : If you make an offer of ten cents, why should you not take them whether you inspect them or not ?

Mr. MacLaren : If you are fool enough to make a bargain with me to buy them subject to inspection that is your fault. (Applause.) The buyers are willing to come to this board, and if you salesmen say you will not sell cheese to any buyer except one who will inspect the goods beforehand, then the buyers will inspect your goods.

A Member : Supposing you and several good buyers and a half a dozen others go to the factory and inspect these cheese, they will be all bored to pieces before they are sold.

Mr. MacLaren : I would sooner have a cheese bored to pieces than sell them on the market, and then have them rejected and thrown back on my hands.

Mr. Steinhoff : I understand Mr. MacLaren to say that they can be inspected, and then sold on the board afterwards. I do not think that is practical. It will often happen that several buyers will go to the factory and inspect the cheese, and they might not be sold that day on the board. They might not be sold for two weeks, and then the buyers would have to go over the ground and inspect them again.

Mr. MacLaren : I think it is practical. If I go around to inspect a lot of cheese before they go on the market, if they are not sold that day I will not have to go around before the next two weeks, because I will take my chance. Unless we have very severe weather the cheese are likely to be all right two weeks from the time I inspect them.

A Member : It seems to me that this matter of inspection could be settled. Why not ask the Government to appoint an inspector, and have cheese that are ready to sell inspected, and then sell them on the board ?

JUDGING THE CHEESE.

By A. F. MacLaren, Stratford.

I may say I am delighted to see so many dairymen here to-night, and so many dairy-maids. We have here on the platform the cheese that won the prizes, and I have the names of the winners, that is I have the numbers. I do not know who the exhibitors were. I will read off the numbers and Mr. Hately will give you the names of the exhibitors, so that you cannot accuse me of being partial. I do not know yet who took the prizes.

PRIZE LIST.

Class 1, Section 1. September White Cheese. 21 Exhibits.

1st prize to exhibitor No. 5, W. G. Medd, Medina.
2nd prize to exhibitor No. 18, W. J. Goodwin, Brussels.
3rd prize to exhibitor No. 23, T. O'Flynn, Tavistock.
4th prize to exhibitor No. 19, G M. McKenzie, Ingersoll.

Class 1, Section 2. September Colored Cheese. 15 Exhibits.

1st prize to exhibitor No. 21, W. B. Thomson, Nile.
2nd prize to exhibitor No. 6, Frank Boyes, Kingsmill.
3rd prize to exhibitor No. 1, J. H. Williams, Lyons.
4th prize to exhibitor No. 15, Connolly Bros., Thamesford.

Class 2, Section 1. October White Cheese. 23 Exhibits.

1st prize to exhibitor No. 14, Frank Travis, Courtland.
2nd prize to exhibitor No. 15, Connolly Bros., Thamesford.
3rd prize to exhibitor No. 23, T. O'Flynn, Tavistock.
4th prize to exhibitor No. 22, Alex. McKay, Brooksdale.

Class 2, Section 2. October Colored Cheese. 15 Exhibits.

1st prize to exhibitor No. 20, Geo. A. Boyes, Putnam.
2nd prize to exhibitor No. 7, John Connolly, Malcolm.
3rd prize to exhibitor No. 14, Frank Travis, Courtland.
4th prize to exhibitor No. 17, J. J. Parsons, Jarvis.

In the September White Cheese
For finish 5 scored perfect.
9 scored 9½.
6 scored 9.
1 scored 8½.
In the September Colored Cheese
For finish 5 scored perfect.
8 scored 9½.
2 scored 9.

In the October White Cheese
For finish 7 scored perfect.
11 scored 9½
5 scored 9.
In the October Colored Cheese
For finish 3 scored perfect.
9 scored 9½.
3 scored 9.

The highest score was 97 points, out of 100. I find great deficiency in the finish of these cheeses. In some cases where the cheese was almost perfect in flavor the finish was bad. One cheese particularly that scored the highest in flavor scored one point down in finish, and that should be a lesson to the man who made that cheese In the future to finish them better, and I think it will be a lesson to every one of these makers the next time they are finishing cheese. The flavor was bad in some cheese, and I wonder at the cheese-makers sending them here at all. They evidently did not look at them before shipping.

I have been asked to say a few words with regard to the Toronto Exhibition. I may say that I have the honor of being a Director of the Toronto Industrial Fair, and

during last fair I was Chairman of the Dairy Committee. As you all know, the dairy products were exhibited under the grand stand for a number of years, and I have been making a great kick, together with the Dairymen's Association, that we should not have one of our greatest industries under the grand stand. We have been kicking so hard that now they have arranged to build a grand dairy building, costing $14,000, some place in the middle of the grounds. The by-law carried that was placed before the electors of the City of Toronto granting $133,500 to improve the grounds and buildings. As far as I am concerned, I think the Toronto Industrial is the greatest advertisement Canada has, and I think it would be a great calamity to Canada to see that exhibition go. I hope to see a magnificent dairy building erected on the fair grounds this summer and ready for use in the fall. The idea is to have it for the purpose of exhibiting butter and cheese, and also for the purpose of exemplifying the manufacture of butter and cheese. We intend to have these products made there, through the whole exhibition, starting in the morning and keeping it up the whole day. I was very much surprised this fall to see the interest the farmers of this country take in going to see the object-lesson of making butter at the fair, and I am satisfied that if we give the seating accommodation for a couple of thousand people we will have them full all the time.

TORONTO EXHIBITION, 1901—PRIZE WINNERS.

Sec. 1—Cheese—June and July. 11 Entries.

	Prize.	Points scored.
Wm. A. McLaren, Avening	1st	95½—93½
Geo. A. Boyes, Putnam	2nd	94 —93
M. Morrison, Harriston	3rd	93 —93
Jno. Connolly, Malcolm	4th	95 —90
J. W. Clarridge, Glen Huron	5th	93 —91
J. S. Isard, Paisley	6th	93½—89½

Sec. 2.—Cheese.—June and July. 14 entries.

J. W. Clarridge, Glen Huron	1st	95¼
R. W. Thompson, Springbrook	2nd	94½
J. S. Isard, Paisley	3rd	91¾
M. Morrison, Harriston	4th	91
J. R. Burgess, Blueval-	5th	90
Mary Morrison, Newry	6th	89¾

Sec. 3.—Cheese.—August. 38 entries.

Mary Morrison, Newry	1st	97
G. E. Goodhand, Milverton	2nd	96
W. A. McLaren, Avening	3rd	95½
Geo. A. Boyes, Putnam	4th	93½
J. S. Isard, Paisley	5th	93
T. E. Whattam, Picton	6th	92

Sec. 4 —Cheese.—August. 42 entries.

R. H. Green, Trowbridge	1st	97
Mary Morrison, Newry	2nd	97
R. Elliott, South March	3rd	96½
Geo. A. Boyes, Putnam	4th	96
T. E. Whattan, Picton	5th	95½
G. E. Goodhand, Milverton	6th	95

Sec 5.—Truckle Cheese. 7 Entries

Mary Morrison, Newry	1st	96
W. F. Gerow, Napanee	2nd	93½
R. W. Thompson, Springbrook	3rd	92½

Sec. 6.—Butter. 13 Entries.

Isaac Wenger, Ayton	1st	97½
H. Weston Parry, Compton, Que.	2nd	97
J. C. Bell, Winchelsea	3rd	95½
F. J. Sleightholm, Strathroy	4th	95½
W. H. Brubacher, Fergus	5th	94½
J. Ireland & Son, Beachville	6th	93½

Sec. 7.—Butter. 12 Entries.

	Prize.	Points scored
Geo. Balkwill, Lafontaine	1st	96½
F. J. Sleightholm, Strathroy	2nd	95
John McQuaker, Owen Sound	3rd	94½
W. H. Brubacher, Fergus	4th	94
H. Weston Parry, Compton, Que.	5th	93½
Harry Heeks, Palermo	6th	93

Sec. 8.—Butter. 11 Entries.

Isaac Wenger, Ayton	1st	97
F. J. Sleightholm, Strathroy	2nd	95½
W. H Brubacher, Fergus	3rd	95
Henry Heeks, Palermo	4th	94
J. C. Bell, Winchelsea	5th	93½

Sec. 9.—Butter. 8 Entries.

Mary Hunter, Rockton	1st	93½
C. E. Rogers, Dorchester Station	2nd	93
A. Hutton, Brampton	3rd	92
W. Parkinson, Jarvis	4th	91½
James Dolson, Alloa	5th	91
Mrs. N. Klein, Holstein	6th	90½

Sec. 10.—Butter. 11 Entries.

Mary Hunter, Brampton	1st	94
J. Dolson, Alloa	2nd	93½
W. Parkinson, Jarvis	3rd	92½
Duncan Stewart, Hampstead	4th	92
Mrs. Wm. Willis, Newmarket	5th	91½
Wm. Whitelaw, Meaford	6th	91

Sec. 12.—Butter. 17 Entries.

A. Hutton, Brampton	1st	96
W. Parkinson, Jarvis	2nd	95½
Chas. E. Rogers, Dorchester Stat'n	3rd	95
Wm. Whittaker, Meaford	4th	94½
Mary Hunter, Rockton	5th	94
Duncan Stewart, Hampstead	6th	92½

Sec. 15.

C. Richardson & Co., St. Marys 1st

I hope to see every dairy man take an interest in this Toronto Industrial Fair, and I hope to see every dairyman and the patrons of the factories and every factory represented with exhibits of butter and cheese. We are going to have grand accommodation for them. I myself personally guaranteed that the new building would be

filled with dairy products and dairy men, so I hope you will all back me up in trying to make it a success, and in trying to encourage the people to carry on the good work there by showing that we appreciate the new building which we are going to have.

TRANSPORTATION.

By A. F. MacLaren, Stratford.

You all know this transportation problem is the greatest problem facing the agriculturists of this country. I do not know of anything that is of greater importance to the people of this country. You may talk about making finer cheese and butter, but if you have to pay so much of your profits in transporting this butter and cheese from your farms to the markets in England I think it is a serious matter, and I hope the time has arrived when we can go to work and put our shoulders to the wheel and reduce the charges of transportation. We have been talking for years about appointing railway commissions to investigate this matter, but up to the present day very little has been done. I think now is the time that we should go to work and try to have this matter settled. I want to read some quotations and make some comparisons with regard to our shipments from Western Ontario and shipments from the same distance on the other side of the line.

Rates of Freight for 1897 were as follows :

Cheese—Montreal to Liverpool	21s. 9d.	or $5.43	per ton
" —Boston "	13s. 3d.	" 3.30	"
Butter—Montreal "	26s. 9d.	" 6.68	"
" —Boston "	13s. 6d.	" 3.37	"

Rates for 1899 were as follows :

Cheese—Montreal to Liverpool	23s. 6d.
" —Boston "	15s.
" —New York "	17s.
Butter—Montreal "	25s.
" —Boston "	15s. to 17s.6.d.

Rates for 1901 were as follows :

Cheese—Montreal to Liverpool	20s. to 22s. 6d.
" —Boston "	11s. 3d.

Bacon and Hams—Montreal to Liverpool.

Season 1899	15s. to 20s.
New York to Liverpool	10s. to 15s.

That will give you a little idea of American and Canadian rates. You see what a tremendous difference there is there.

The rail rates from points west of Toronto to Montreal average 33 cents per 100 lbs., equal to $6.80 a ton. Taking our exports for the year 1899, a comprehensive statement of which was compiled consisting of our leading staples of cheese, butter, bacon, hams, etc., apples and cattle there was, according to the Montreal Harbor report for that season, in minimum quantity exported from that port :

50,000 tons of cheese, 10,000 tons of butter, 50,000 tons of bacon and hams, 270,000 barrels of apples, and 46,000 head of cattle.

All of the above were carried by the railways from various points in Ontario, and investigation shows that the rate of transportation paid to these roads is more than 25 per cent. higher than for a relative rail haul upon American lines. Thus analyzing our railway and steamship rates and applying their excess charge over either Boston or New York the extra profit upon the above would be as follows :

50,000 tons of cheese, $3.50 per ton	$175,000
10,000 tons of butter, $4.00 per ton	40,000
50,000 tons of bacon and hams, $3.00 per ton	150,000
270,000 barrels of apples, 40c a barrel	108,000
46,000 head of cattle at $4.00 per head	184,000
	$657,000

This result is what these exports, via Montreal, have cost the Ontario producer for freight more than his American competitor paid upon a like quantity from either Boston or New York. But this is only a partial view of the picture. Almost as large a volume of these commodities, for want of proper shipping facilities and despatch from Montreal, was forced to find a way out by American railways to American ports, and upon which was paid $3 per ton for longer rail haul, which, added to the excess upon the Montreal volume will total more than $1,000,000 extra profit received by the transportation outfit upon this partial volume of our exports.

For the past season the exportable value of our cheese, butter and bacon represents $40,000,000, an amount considerably in excess of two years ago. In tons this volume would represent 250,000 tons, upon which we have paid out $1,000,000 for getting it to market more than we should on the basis of American transportation rates, and our cheese has been handled largely in a condition that has depreciated its value another half million.

And thus it is all along the line with every class of our products, for example: The export wheat rate from Buffalo to Liverpool during the past year was 11 1-2c.

From Western Ontario points.. .. ..21c

Cattle Rate—

From Toronto to Portland.. .. ..28c

From Chicago to Portland.. .. ..28c

From Chicago to Moutreal.. .. ..25c

From the Counties of Bruce, Huron or Grey ....33c to Montreal.

A carload of cattle from Listowel, Wingham, Lucknow or Kincardine to Montreal would cost $1.25 per head more than from Chicago.

You will probably, in your mind, be asking me what is the remedy for all this deplorable condition of things. I would answer you by inviting you to follow me for a few minutes across the line, to where our American friends have been doing things upon a most gigantic scale. I mean in regard to the development of their great 1,000-mile waterway between Duluth and Chicago, Milwaukee, etc., and Buffalo—a thousand-mile water haul. Twenty years ago, in 1880, the rail rate from Chicago to New York was 19 1-2c. per bus. In 1899 the rail rate from Chicago to New York was 11c. During the same period, by water, the rate was as follows :

1880.. ... ... 13 cents.

1899.. ... ... 5¾ cents.

This steady decline in rates, here shown as being the direct result of waterway improvement at the Soo and other channels.

Now, another interesting feature about these rates is the cost. According to undisputed authority the great volume of tonnage which now passes through the Soo Canal, and which this year exceeded 28,000,000 tons, was moved at a cost of 80-100ths of a mill per ton per mile. The average cost upon eighteen trunk lines of railway in the United States is shown to be eight mills per ton per mile, so that we have here an object lesson that the United States waterways from Duluth and Chicago to Buffalo, 1,000 miles, are carrying freight for one-tenth the rate of the railways running parallel thereto. In other words, the waterway is doing for $1 what the railways would get $10 for.

It has been estimated by those identified with the commerce of the great lakes that the 40,000,000 tons moved upon the lakes last year, west of Buffalo, if carried upon the basis of railway rates, would have cost the American nation $200,000,000 more than it did, and it is further estimated that at least 10,000,000 tons of the commerce passing through the Soo Canals would not have moved except for the facilities of water transportation. The railway charges upon it would more than equal its value at the point of destination. I have pointed out to you the activity that is to be found upon the American waterway—its marvellous development, and what a tremendous force it has been for the development of that country's western resources. I want you now to turn your eyes upon our own country and our own waterways.

and what is the conspicuous feature; that, although we have from the head of Lake Ontario to the seaboard a waterway unsurpassed and upon which we have, as a Province, contributed $47,000,000 for the improvement of the canals, etc., we have not a single steamship to haul our products to the seaboard. This is my answer and my solution for the condition that exists to-day in this country and the excessive railway tax that is being levied upon our Province—a Province in which our agricultural interest represents an investment of $1,200,000,000, with an annual output of $300,000,000 of wealth, wrung from its soil by the industry and labor of 1,125,000 of our inhabitants.

If this great problem of transportation is solved upon true commercial lines we will have two cows where there is one, we will have two families where there is one, we will quadruple our export and we will double our farm land values.

During the past year the rates of freight and insurance, via our Montreal port, have been so excessive as to be practically prohibitory. As an illustration: The rates for cheese from west of Toronto in Ontario have ruled about as follows to, say, London, England:

Via Montreal.. .. .. 68.90 cents per 100 pounds.
Via Portland.. .. .. 55.50 cents per 100 pounds.

Insurance via Montreal has run from 40c per $100 to $1.20 per $100, and via Portland 30c to 35c per $100.00. Why should the rate out of Montreal be 68.90, as against Portland's 55.50? Why should there be such a difference in the insurance?

If you could distribute the extra freight rates that they are charging us in this country among the farmers it would buy a good many farms, a good many head of cattle and a good many boxes of cheese.

I simply give you these few facts and figures, which speak for themselves, and they are facts and figures which you cannot dispute. You can hunt up the blue books, and you will find that they are correct. I want to suggest that there should be some means of using our waterways. I do not think it would pay to put on freighters on Lake Ontario, starting at Hamilton or Toronto, because they could not get freight to make it pay, but I do say that if they use Lake Superior and Lake Huron and brought all this freight from the west during the summer season and transport it from Owen Sound and these other lake ports and send it right through to the seaboard we could do the same thing that they are doing across the line. If they can do it one side of the lake why not on the other. If we can save 25 per cent. on the products of this country in freights do you not think it would be a grand thing for this country? I think it could be done, and I want to see the people of this country go to work and think about it. There is nothing in the world will tend to increase our population so much as getting our freight rates reduced.

I feel very serious about this subject. I think it is all right to talk about making more cheese and butter and raising more cattle and hogs, but why should we go to work and give one-quarter of it away? And if we could use our waterways I think we could save that money. Of course, I think I know why our insurance rates are so high from Montreal. It is on account of the treacherous St. Lawrence route, and I think the Government should fix up that route. They claim they are doing so many good things. I think the sooner they make that route safe the better it will be for all concerned. I am only a humble member of the Opposition, but I will hold up both hands and do anything I can to assist in getting better transportation.

The President: The facts and figures presented by Mr. MacLaren are no doubt startling, and I know the rates are true, and I know the people of this district west of Toronto are more interested than the men of the east. I know you pay a much greater rate out of this section than the men out of the eastern section. I know the railway companies join together and agree among themselves to get a higher rate out of you by Montreal than they get out of you by Portland, and I know your cheese are tremendously injured by shipping by Portland. I have had a lot of experience. I believe we were the biggest shippers out of Portland this last summer, and I believe we suffered enough to pay three rates out of Montreal. In quoting cheese to our customers in England, if our quotation is six pence higher we cannot sell our cheese,

and it is necessary to quote our cheese by the cheapest route in order to sell them. The facts of the matter are that the C.P.R. use the St. Lawrence route and make that route by Quebec in order that they may make a competitive rate to get these goods by the C.P.R. and haul them to Quebec instead of Montreal.

In future we will have steamers with cold storage out of Montreal, and you had better ship your cheese by these cool steamers; but we want a cheap rate out of Montreal. It should not be possible for the C.P.R. to say to you we will take them from Quebec at a rate of 13c a hundred cheaper than we will from Montreal, and I feel that when it comes for the time for resolutions that there should be a resolution on that subject.

JUDGING THE BUTTER.

By I. W. Steinhoff, Stratford.

The committee has the following report on the butter which I have had the honor of judging.

Class 3. Section 1. Creamery Butter in 56 lb. Boxes. 17 Exhibits.

1st.—E. H. Johnston, Innerkip : Flavor, 43.50 ; texture, 24.50 ; color, 15 ; salt, 10 ; finish, 5 : total, 98.
2nd.—G.M.McKenzie, Ingersoll : Flavor, 43 ; texture, 24.50 ; color, 15 ; salt, 10 ; finish, 5 ; total, 97.50.
3rd.—Wm. Waddell, Kerwood : Flavor, 43 ; texture, 24 ; color, 15 ; salt, 10 ; finish, 5 ; total, 97.
4th.—Jas. Ireland, Beachville : Flavor, 43 ; texture, 23.50 ; color, 15, salt, 10 ; finish, 5 ; total, 96.50,

Class 2. Section 2. Creamery Butter in Prints. 18 Exhibits.

1st.—W. K. MacLeod, Vanneck : Flavor, 43.50 ; texture, 24 ; color, 15 ; salt, 10 ; finish, 5 ; total, 97.50
2nd.—Jas. Ireland, Beachville : Flavor, 43 : texture, 24 , color, 15 ; salt, 10 ; finish, 5 ; total, 97.
3rd.—J. R. A. Laing, Avonbank . Flavor, 42.50 ; texture, 24 ; color, 15 ; salt, 10 ; finish, 5 ; total, 96 55.

The butter resembles in quality what I saw at the Pan-American, and considering that that was grass-made butter and this fodder-made butter, I think the exhibit is a good one. Every butter maker should take advantage of these exhibits to show his butter, so that he may be able to compare his make with that of other makers, and in that way see his defects if he has any. Butter in coming from the creamery to the place where it is exhibited is liable to take a flavor from almost anything surrounding it, and it might deteriorate on the way to the exhibition.

It might not be out of place for me to say a word or two in regard to the display I saw at the Pan-American. It was a very large one. We scored in two days 330 packages. There were only sixteen from Canada. But while the Canadian exhibit was insignificant in comparison in numbers, it certainly was not insignificant in the scoring which it got, and the standing which it obtained. As near as I can remember I think there was only one exhibit out of that 330 packages that scored 98 points, and that came from Minnesota, while the highest score from Canada was 97 1-2, so in that we have nothing to complain of. In fact, I think we have something to feel fairly satisfied with.

Comparing this year's exhibit with last year's I cannot say that there has been an improvement, because I did not judge last year's butter, but from what I saw and from what a number of others saw of last year's exhibit we believe there is an improvement, and I trust that if I have the honor of judging again we will see a still further improvement, and I assure you that I heartily wish every maker of butter and cheese the utmost success in future, and that the quality will be steadily improving. (Applause.)

ADDRESS.

By G. C. Creelman, Superintendent of Farmers' Institutes, Toronto.

I have only time at this late hour to congratulate you upon the splendid attendance you have had from the beginning, and the splendid attendance you have to-night. I want to congratulate the Dairymen's Association of Eastern Ontario as well as of Western Ontario, because you have got to work together for the good of all and for the good of the country in general. I want to congratulate you upon the work you are doing, because in my position of Superintendent of Farmers' Institutes, travelling about from county to county, I have an opportunity of seeing just exactly what you are doing in the individual creameries and cheese factories of the Province. I want to congratulate the Dairymen's Association upon the support which they are giving the dairy schools at the present time. These three schools, your own school in Strathroy, the school in Kingston, and the dairy school at Guelph, are filled almost to their utmost capacity. And I am very glad that the young men of the Province are seeking these occupations. Times are changed very much from what they used to be. It used to be necessary for a young man to complete a thorough education ; that he should go through the university and have B.A. to his name ; but we have come now to a time in the educational history of the Province that a young man can in an agricultural profession, or any of these branches, bring just as much honor to himself and his parents, and to the country, as if he takes a course at one of our great universities. I am glad so many of the young men are taking advantage of the cheap courses at these institutions to prepare themselves for practical citizenship in this great country. The other professions are being overcrowded. The profession of law requires many years of hard labor from the student—from four to eight years in public schools, four in the Collegiate Institute, four years in the university and three years at Osgoode Hall. And when he is through he finds that there are lawyers in the large cities who are willing, after studying for sixteen or eighteen years, to give up their practice and accept a municipal clerkship at $600 or $1,000 a year.

The profession of medicine, one of the grandest professions, a profession which allows a man to do so much for the human race, is also being over crowded. The older men can remember that in your native towns and villages two or three doctors, and in some cases, one doctor, were able to do all the work necessary. Now, there are in towns of 3,000 of 4,000 seven or eight physicians. When our young men were called to go to the front to fight, to bleed, and if necessary to die in South Africa, 140 medical men offered their services to go with the second contingent, and it was believed by those who know, that even if their services had been accepted there would have still been enough doctors left in the Province to attend to any sick who might have remained home. Unless we wish our young men to seek some other country for a livelihood we should hesitate before we encourage them to enter these professions.

There is one more, and that is the honorable profession of public school teaching. Now it once was that a man went into school teaching with an idea of making it a lifelong profession. The time has come now when we have so many teachers that our boys seek simply to make that noble teaching profession a stepping stone to some other profession, and it is one of the saddest sights I have ever witnessed in going about the country when I drop into a school house in the afternoon, and find a girl sixteen or seventeen years of age, or a boy of the same age, in charge of the young girls and boys of that district. The competition has got so great that they are doing this, and I say it is sad to see our little children put in charge of such school teachers. We have nearly perfected the school system in the Province of Ontario, and we have got it in such shape that we have first-class school teachers in our high schools, and our boys are placed in such a position that they start to school early, and they can take these examinations and then they take three months at the

model school and qualify. So great is the rush for positions that a school trustee down in a town of western Ontario told me the other day this story: He said one of the saddest things in his life happened on the preceding day. He went on to say that as a member of the school board he was called upon to select an assistant teacher, and he said there was 76 applicants for that assistant position, and the salary only $230 a year. "Now," he said, "the sad thing to me was that 75 bright young men and women had spent the best of their lives in preparing themselves by hard work had to be turned down when the salary was only $230 a year." A young man of my own acquaintance in the town of Cobourg, a bright young fellow, a specialist in mathematics, a graduate of Trinity University, Toronto, at the head of his class in mathematics, he was what might be called a born mathematician, thought he ought to have no trouble in getting into one of our high schools as a teacher of mathematics, but when he came to make application he found the positions were all filled, and that young man after spending four years at Trinity University, was forced to accept a position on Manitoulin Island at a salary of $35 a month. And he went back there and buried himself at that salary. Now I think it is a hopeful sign that our parents are directing the attention of a lot of our brightest boys to such things as cheese-making and butter-making and back to the farms, where they have scope for all their genius, because there is no place where there is greater scope for the bright boy than on the average Ontario farm under the present splendid conditions. (Applause.)

I therefore congratulate this Association on taking up this practical work, and I hope you will go ahead and push it forward and get the farmers into closer touch with the butter and the cheese men, because I do not think they are as close as they should be. I have heard good practical farmers say that things go on in cheese factories that they know nothing of. They say the cheese maker talks about carbohydrates and albuminoids, and the farmer does not know what he is talking of, and he says they have infernal machines for getting butter fat out of the milk that we know nothing of. Now if we could get the practical farmer into the factory it will be much better, and if I can enable you to hold dairy institute meetings at the factories and in the creameries, and bring the farmer and the butter and the cheese maker together so they could talk over their troubles, I believe we could do a lot towards helping that great problem of how to look after the milk between the cow and the factory. (Applause.)

The Chairman: I have now great pleasure in introducing Mr. Eli Bourbeau, who will address you for a short time. He is a cheese instructor at St.Hyacinthe, and he is the most alive man in Quebec on dairy matters. He has had a lot of experience, and has been sent by the Government of Quebec to Europe. He has made cheese in England and has had his cheese imported to this country. It is unusual to have cheese brought from Englaud to Canada, but he has had English cheddar cheese brought out to this country in order to compare it with the product of Canada.

Mr. Eli Bourbeau, St. Hyacinthe, Que: I think my first duty should be to excuse myself for not being able to speak English as well as I would like to, but you will admit that when a young man is born and brought up where there is not an Englishman it is very hard for him to speak very good English. I thought I knew before to-day what was the cause of the success of the dairy industry in Ontario, but I must admit frankly that I did not know. I knew that you had very good instructors, very good buildings and very good cheese makers, but what I learned to-night is that besides the iustructors and makers there is a large crowd of intelligeut farmers to back them up. I always hoped that we in Quebec would be able one of these days to fight with our friend Ontario, but I must admit frankly that I am afraid of victory to-night, and the reason is because you have the ladies with you. When I was over at the other side of the water at Paris and at London the Englishmen bought a lot of Ontario cheese. One man over there told me he had bought 1,000 cheese from Ontario, and that he had 999 of them all alike, and I think that is the best compliment that could be paid to this country. Before leaving you it is one of my duties to thank the people of Ontario for what they made of me in the dairy industry. I

first went to learn cheese-making under the Macpherson combination, where Mr. Ruddick was the instructor, and the second time it was in Brockville under Mr. Derbyshire and Mr. Ruddick was inspector. Some of you may think it was a bad thing for Ontario people to educate other people to make cheese like themselves. I think the contrary. I think Canada should stand like one man—(applause)—and the time is past when we have to speak of Ontario and Quebec, especially regarding the cheese industry. It may be useful for some politicians. We have lots of competition, and if we make bad cheese in any part of Canada the whole country will suffer for it, and the better cheese we make the more beneficial it will be for the whole country.

ADDRESS

By Hon. John Dryden, Minister of Agriculture, Toronto.

I am delighted to find that the interest does not lag in this Association, judging by the meetings you have held yesterday and to-day, and by this magnificent audience which greets us here to-night. I am glad that it is so. One would think that, after years of education and agitation, we would have arrived at the time when there would be no need for gatherings of this kind, and that we could go on our way, but that time has never come yet, and I want to say to you it never will come. New problems and difficulties are opening every year and we have to solve them.

I am delighted, Mr. President, to find you in the chair. When I first came to a meeting of this Association there was another Ballantyne on the platform. He is not here tonight. The President was one of the boys in those days, and we did not see much of him on the platform, but I am glad to know he is quite able to take his father's place, and that his interest is unabated in the cheese industry in which his father was so long connected in this country.

I find that there are those who say that danger faces us in the near future. The Hon. Mr. Fisher, on two or three occasions, has given us words of warning, and in speaking at the Dairymen's Association the other day at Whitby, he again issued a note of warning. In fact, he said it was his duty, and he felt pained in bringing it before the Association. His word of warning was this, that if something was not done we were likely in this country to lose our trade with Great Britain. He said that from the information that was brought to him as head of the department he learned that altogether too much of the cheese exported from this country was now arriving in what they called a bad condition. He told us there were various causes for this, and he mentioned some of them. It was enough for me to hear that there was any danger in this direction. It has troubled me ever since, and I have been pondering over it, and I have been thinking to myself, and saying to myself, "Is it possible in this young country, so full of energy and life and skill, that it could be said there is danger, after all our effort and education, of our going backward instead of forward?" And I also have said to myself, "Is there no way whereby we can hold this trade?" And I said, "Yes, there is, we can hold it, we must hold it." But then as I thought there came in that nasty little word, which bothers you a good deal and it bothers me, "If." "If what?" If every man connected with the trade will only do his duty. (Hear, hear.) I mean "every man" engaged with it, and so I began in my mind to forge a chain which would be long enough and strong enough to hold this trade with certainty, and after I got it forged in my mind—of course I was not in a blacksmith shop—after I got it forged I found there were seven links in it, and as a chain is no stronger than its weakest link, it meant that every link must be made as strong as possible if we are to hold the trade.

My first link, starting at the beginning, was the owner of the cow, because it is manifest that unless you have the raw material pure and clean no product can be put upon the market. And it is manifest too that the man who owns the cow

can spoil the milk very easily. He may spoil it by dishonesty. You all know how easy it is to have a pump to help him in this matter, but if he undertakes to use a pump he does that wilfully. But I want to point out that this man who milks the cow is liable to spoil the milk ignorantly, not understanding what the result of certain things will be. It is quite possible for him to spoil the milk by improper care and improper feeding of the animal. These are things you are accustomed to discuss. Most of you here know just as much about them as I do, but there are some people engaged with your factories who do not have the knowledge you gentlemen have. And they are ignorantly destroying the value of this raw material.

Then the man who milks the cow is liable to destroy the product also, and the scientists will tell you how certain bacteria and yeasts get to work in this milk. The man who owns the cow does not know this, and if he does not know it he ought to be made to know it, and he ought to understand it. But it is possible for the man who milks the cow to damage the milk and to destroy its value to a certain extent, and it is possible when he gets it in the pail and sets it down in the stable he will get germs which will destroy to a certain extent the value. And so this man, the owner of the cow, makes the first link in this chain and we must have it strengthened if possible. I will tell you how you do it. Sometimes you scold and you jaw this man right here in your convention, and you say nasty things about him, and I do not blame you. But will that reach him? Or will you reach him if you undertake once in a while to punish him by law? There is no use talking to him in these conventions, because he is not here. Some people say there are two classes of people who never need to go to school or college. One is a genius and the other is a fool. These men whom I am talking about are all men of genius, and they do not need to go to a convention because they know it all now. I do not wonder at Mr. Creelman's saying they talk about infernal machines. They think that somebody is trying to take something out of them all the time. Now there is no use in scolding the man. Even if you had him here you would hardly get anything out of him in that way. Men are liable to stand back in the harness. We are all made in the same way, more or less—and generally more. If you treat him in that way he will turn mulish—perhaps I should say donkeyish. I do not know which is the stronger term. I would like to use the very strongest. The Scotchman would call it "dour," he won't do what you want him to do. Mr. Creelman made a suggestion here. If it is only carried out it will make this link in the chain stronger than it is, and that is, if these men won't come to our conventions then you will have to go to them. I do not want you to wait until you are invited. There are hundreds of factories in the west that have never had an instructor. These are the people that need it most. We must press our suit upon these people, and make them understand they are partners in this concern, and that they have individual responsibility in this concern. We must let them know they are injuring themselves, and, while injuring themselves, they are injuring everybody else and the country; and if they still rebel and will not change their methods, then I have got to say, according to Scripture, that you can withdraw from them, turn them out, refuse to have them as patrons to any cheese factory in this country, and tell them they are no Canadians or they would not take that ground. I will not acknowledge men like that as Canadians. If he will not learn when you try to teach him, then we must turn him adrift and let him go to grass for a while, and he will come to his senses. Some of them do not need to be reached. I am prepared at this meeting, and in your presence, to suggest that if he cannot be reached by our present machinery we must provide some other means, and I am prepared to say that I will suggest to my colleagues that we shall have a Government instructor to be appointed and paid and controlled by my Department, and I will see that these instructors get to the place where we want them. (Applause.) This is perhaps a hold thing for me to say. I do not want to take it out of your hands, but if you have not got money enough we must find money enough. We cannot let this trade slip, and we must make this link in the chain just as strong as necessary in order to hold this trade.

The second link is easier. The handling of the milk between the farm and the factory. Now it is quite possible if the milk is clean and pure when it is received by the man who transports it from the farm to the factory that it may be injured in his hands. If he loiters along the road and lets it stand in the hot sun too long, jolting it in the waggon, and so on, it is liable to be injured. And if he will not do the work properly then we must get somebody else that will; and they are so much fewer in number than the ones that compose the other link that it will not be difficult to fix this link, and it is very easy to make it strong enough to hold.

The third link is the maker, and I think I have a right to say that with proper care in selecting these men this link ought to be, and probably is now, the strongest one, and it seems to me the time has come when we can leave the makers of the cheese to the dairy schools, where they get proper instruction if they take it, and let us devote our attention to the other people who do not have this opportunity. The makers must do their work properly or otherwise our chain will not hold. I will assume that they are ready and prepared, and willing and anxious to do their part of it properly.

Then the next link is the curing of the cheese. Now you have been discussing this at this convention, and it was discussed a good deal in Whitby, and those who know most about it are telling us that the temperature at which cheese is cured means everything, and that we must have a cooler temperature, and here comes a new problem. If we must have a cooler temperature, why not set ourselves about to get it? Whatever is wanted in the way of cold storage ought to be got. Mr. Fisher said that his Department was ready to help if you will only help yourselves. We have on the Statute books of Ontario a law by which you can secure assistance, and if any of you people go to work and put up a cold storage, if it costs you $2,500, the Ontario Government will give you $500, and I believe Mr. Fisher will help still further. I do not believe in helping people too much unless they help themselves. You are interested, because it means more money for the product which you are putting upon the market. Our bill only allows us to give $500, but we can give 1-5th of the cost until it reaches $500, and that is the most the law allows us to give. With a moderate amount of ice I think it is quite possible to have a proper cold storage plant. If you cannot get it in that way let us unite our forces and put one at such a point where a number of factories can utilize it, so that this link in our chain will be as strong as possible.

The fifth link in my chain is transportation, and I was delighted to hear my friend talk about transportation. I told him I was prepared to back him up in every part of it. First from the factory to the station. If the distance is short there is no difficulty, but if there is a long distance to go there is liable to be trouble, because the jolting waggons are not the best way to transport cheese, and sometimes they are carried in a very hot sun. We can get over this difficulty by having springs on the waggons and building some kind of covering to protect the cheese. This is an important link and it ought to be a strong one.

The sixth link is the railway transportation, and here we have to throwm down our hands and say we are perfectly helpless. We take what they give. We come to the railway, and we ask for a car, and we have to take whatever they give us, and so the individual men in this assembly are perfectly helpless. But so far as I am concerned, and my position will allow me, I am prepared to come to the help of the people, and I think we have a right to call upon the Hon. Mr. Fisher to undertake to help us as far as railway transportation is concerned. If the cheese is overheated on the cars you cannot expect to get it from the station to the steamship in proper condition. It is a matter than can be remedied. These railway authorities are very selfish, and look out for the dollars and cents, yet I find they are very susceptible to argument, and if you show them that by a certain line of conduct on their part they will bring more trade to the railway I have found they are very susceptible to argument.

My friend Mr. Hodson, the Live Stock Commissioner, knows we have gone to the railway in connection with live stock matters, and it is wonderful what they have of that kind.

done for us in this regard. Do not go to them individually. They will just listen to you and then smile, and say "Good afternoon."

Go to them through your Association. Let a committee of this Association and a committee of the Eastern Association, backed by the Ministers of Agriculture for the Province of Ontario and for the Dominion, and any other influential people you like, and say to them, "If you will do so and so it will make it so much better for us and for the railway." I believe in that way you can reach them. I know they are selfish, but we must have attention paid to us in this matter. They are like other men. We will have to get at them through members of Parliament, because we cannot let this trade go; and we must have freight rates, and cars built, so that we can get our goods to the market in proper condition. And I will back up my friend who read this paper on the question of transportation.

When we have got over the difficulty with the railway company we meet another. We come then to ocean transportation. We have never been treated fairly by these steamship companies. It seems they are the most selfish of any corporation we have to do with, and if they can get freight enough for their ships your cheese can go to the bottom of the ocean for all they care. And they do not care about giving you cold storage compartments if they can get the ships filled with something else. We have talked about public ownership of great franchises, we have talked about public ownership for telegraph and telephone. It seems to me the most pressing thing in this country is for public ownership of steamship lines, which shall be run in the interest of the country, and not in the interest of millionaires who live across the sea and who do not give a button for you or me. (Applause.)

I am prepared to go to any length; and I have often thought if I was in a position when I come up to this question of transportation I could do more; but I am told to step aside, as that belongs to other parties. However, I have often thought I would like to have a hand in it. If I did I think I would say to these people, "We are going to have better service or we will have another line. You can take your choice; but we are going to have better service." I say we have never yet had the service we ought to expect. They tell us they have cold storage. I remember in the old days of Sir Charles Tupper he told us on the platform we have cold storage for you, and here we are to-day complaining of it all these years. We are complaining still that it is not what it ought to be. I do not know who is to blame, but I say we have never had fair play from these steamship companies who are reaping such enormous wealth from this country.

These are my seven links in the chain. Commencing with the owner of the cow and going right through. Everyone of these links ought to be and can be made strong enough to hold this trade. The only question is, are we prepared to join hands and try to weave these links so that they will hold together? I am prepared to do my part. Are you prepared to do yours? Will this Association do its part? Will the instructors do their part? And shall we reach the people and influence them in such a way that the product will be better than it was before? It ought to be more uniform than it has been, and it ought to be put upon the market in a better condition, and if that is done there is really no danger of our losing our trade with Great Britain. If the market has changed, we must change with it. We cannot afford to be conservative in our methods with the world. Do not forget that the only way to reach wealth in this way is to produce not once or twice but all the time a special article and get it upon the market in a proper condition, and if we can do that we shall hold our trade, and secure riches and contentment, wealth and prosperity. (Applause.)

Mr. Pattullo: Mr. Maclaren has given you some important facts and figures. Although the subject is a little outside the ordinary work of the Convention, these facts and figures are such that you should consider them, and, with the remarks of Mr. Dryden upon that subject, I think it is one of the questions upon which you dairymen can influence the Legislature and the public men of this country, and the Parliament of the country. One of the greatest problems of to-day in this country is this great question of transportation. Let me say one or two words in addition to what has been

said. We are subsidizing a number of steamship lines, and I say we should subsidize no steamship lines unless we have a regulation as to their freight rates, and I think we should press for a railway commission. I do not think it will work miracles, but it will improve matters. In the deepening of canals we are endeavoring to solve the problem. "Rome was not built in a day." There is a great deal to be done yet, and we should pay the greatest attention to what has been said by my friends, Mr. MacLaren and the Hon. Mr. Dryden. Has this not been a splendid convention? You are all delighted, I am quite sure. I have been more than delighted with this, and I have been delighted with the kindly expressions which have come from the members of the Board of this Association at the reception they have met with in Woodstock, at the way in which our Mayor and members of the Council and Board of Trade and others have received you. We have only been doing our duty in that respect. We have not, perhaps, done our whole duty, but I venture to say no one man or woman has come to this Convention without going away the better for it, and you will go away better and wiser men and women, whether you are dairymen or not. These Associations are doing noble work. Some of the old men are passing away, but we are bringing out young men in their places.

Now just one word with reference to what Mr. Dryden said. I was more than delighted with an observation he made on one of the links in his chain. It was a perfect chain, and he emphasizes what I was saying this afternoon, that if you want to get at the bottom of the question of making cheese, you have got to get to the patrons. There is the weakest link in the whole chain. And I repeat the suggestion that I made then, because if there are 100 patrons sending milk to a cheese factory and 99 of them are of the right sort and one of them is sending bad milk, the efforts of 99 are spoiled and annuled by the work of the one. If you are going to educate them all, how are you going to do it? You have to get at them through the inspectors, through the buyers, and I say convert your curing rooms into lecture rooms, have frequent meetings there, and if these patrons won't do what is right talk about them in such a way that their ears will burn every day in the week, and you can go there and talk things over, and you will find out your mistakes, and you will know what you are doing, and what the cheesebuyers are doing, and the condition of the market.

I was glad to hear what Mr. Dryden said about the willingness of the Government to give you more inspectors if you want them, and I say build these lecture rooms in every section, at every cheese factory, and then that educational chain I was describing last night will be complete, and you will start with the patrons and work up until your cheese has landed in Liverpool on the table of the British people.

Speaking of the educational influence of the people, let me say a word in conclusion. There are some people who have not been here to-night, who have not been here this afternoon, that I would have liked to see here. Mr. Creelman spoke words of wisdom about the tendency of the present day towards the farm or away from the farm. You remember what he said, "I want to see the boys and girls of the town have their thoughts turned that way rather than otherwise." This is the hope of the country, and I should like to see every high school student in Woodstock attend the session of this Convention. It would have done them good.

ONTARIO DAIRY EXHIBIT AT THE PAN-AMERICAN EXPOSITION.

Mr. J. N. Paget read the following report, on behalf of the committee appointed to make an exhibit of Ontario cheese and butter at the Pan-American Exposition :

One clause in the report of the Directors, at the opening session, referred to the attitude of the Board of the Association in regard to the Glasgow and Pan-American Expositions. While the Directors might not be justified in employing any of the moneys of the Association in promoting dairy exhibits at these Expositions, they were willing to do what they could in assisting to select cheese or butter should the Governments decide to make at exhibit at either or both of such Expositions. The views of the Board were laid before the Ministers of Agriculture both at Toronto and Ottawa. Finally, the De-

partment of Agriculture at Toronto appointed a committee, composed of members of your Board, viz., Messrs. Wenger, Eagle, the Secretary and myself, to arrange for an exhibition of cheese and butter from Ontario, both East and West. One reason we were selected to act on the committee was on account of our living not far away from the Exposition, and that we could therefore give personal attention to each of the exhibits without much expense either of time or money.

The limit given to us for expense, and that we should not exceed, was such that we could not see our way to exhibit at more than two of the four competitions, but the Department of Agriculture at Ottawa came to our aid by assuming all the cost of transportation, enabling us to make displays in July, September, as well as in October, as we first intended. The first meeting of the committee was held on the 4th of June, immediately after which nearly two thousand circulars, explaining the proposal, were issued to the cheese and butter makers of Ontario.

Entries for the July competition were received from 113 makers for 125 exhibits of cheese and 54 of butter. It was announced that the exhibitors would be paid for the cheese and butter forwarded by them for competition, at the market price at the time of shipment, and it was asked that duplicate exhibits should be sent. Arrangements were made to receive these exhibits at the Toronto cold storage companies, and Messrs. Ruddick, Muir and Millar kindly accepted an invitation to act as judges in Toronto, and to select such cheese and butter from the exhibits sent there as they considered good enough to send to the Pan-American. Unfortunately the very extreme and long-continued heat in the latter part of June affected the cheese in the curing rooms to such an extent that only about one-half of the cheese entered was sent forward to Toronto. Even of the cheese that were sent forward some showed signs of heat. This seems to bear out the contention that some better method of caring for the cheese after they are made should be provided. The same method of making selections was adopted in September, and also in October. The September and October exhibits were uniformily excellent in quality, especially those in October, of which not one was rejected. In September 86 exhibitors made entries of 140 cheese, of which 66 were sent to Buffalo, and in October 85 exhibitors entered 122 cheese, of which 74 were sent to Buffalo. In butter there were 35 entries made in September by fifteen exhibitors; and in October, 31 entries by fifteen exhibitors.

In September and October Mr. Ruddick was not able to assist in making the selections, but the work was done by Messrs. Millar, Muir, and Steinhoff. That this work was done well can be seen from the fact that not one exhibitor of cheese failed to secure a diploma, while only two exhibitors of butter were found wanting. We believe that the work was done well and with good results, and we have this week received a notification from the Director-General of the Pan-American Exposition that Ontario has been awarded the Gold Medal for the best exhibit of export cheese. We have also received communications to the effect that the diplomas are in the hands of the engravers, and will be ready for sending out in three or four weeks.

I would ask Mr. Wenger, who was appointed on the committee in the interests of the butter-makers, and Mr. Steinhoff, who acted as judge of butter at one of the competitions at the Pan-American Exposition, to give some account of their observations while there.

The Chairman : I will now call upon Mr. Steinhoff to give the result of his observations at the Pan-American.

Mr. I. W. Steinhoff : I touched upon this subject last night, and I do not know that I have very much to say that would be beneficial to you. I might, however, tell you the method of judging the butter, and some points in connection therewith. The exhibit in October was a large one. There were 330 exhibits, from all over the United States and Canada. Of that 330 there were only sixteen from Canada. One of the things first noticed was the method of scoring. It was done by three judges, two Americans and one Canadian, Mr. Barber of Chicago, Mr. White of Boston, and myself. Butter was brought out of the refrigerator, each judge bored it, made his own score and handed in his card to a clerk or secretary, who made the average. We did not really know what the average

was or what the score was until it was averaged up by the secretary. You may know that we had to work pretty rapidly to score 330 factories in two days. One thing that struck me more than anything else was the variety of packages in which the butter was exhibited. They were all round packages, with the exception of the prints. There was not a square one in the American exhibit. They were all sizes, from 70 pounds to half-pound prints. I noticed a number of small wooden packages that were models of neatness. And I will make that observation wtih regard to all the American exhibits. They were put up neatly, and, as a rule, finished elegantly, and I think a delicate article like butter, that depends upon appearances, should be put up in the most attractive style. The small packages were about five pounds, in wooden packages, lined with paraffin paper and well finished, they were very uniform in quality, and they scored much higher than I expected they would. As a rule we do not expect a small package to hold flavor or keep as well as the large one. Even in prints they had a great variety of styles. Mr. White, of Boston, said you could not sell the square prints in his market, because, he said, they looked so much like bars of soap. There was one very stylish way of putting up prints, about four inches wide and five inches long, and then it was sub-divided, so that you could cut it in half pounds. All of them were of a nice shape, and very attractive in appearance. Let me mention one point in regard to the scoring of the butter. I have been asked with regard to the color. Some said they did not understand why some butter being very pale and other butter of the proper straw color, that both scored the same in color. I only scored down in color in cases where the butter was mottled, because different markets require different color. The Manchester market will take a butter as white as we ever make in Canada, or whiter, and some other markets will take a little color. Our Canadian market requires a little coloring, but they are taking a much milder color in butter than they did a few years ago, and I think we should educate our Canadian customers to use a milder flavored butter, because it often happens that where you are buying the output of a creamery you want part of it put up for the Canadian market and part packed for export. And you can use the same churning for both purposes. Supposing you are using one-eight ounce of color, that will not do for some markets. I am glad to see our Canadian market is taking a milder color. Butter was only scored down here in Woodstock on account of its being mottled, and the same thing applied at the Pan-American. There was some butter there that, if I was judging for export, I would score it down on the ground of color.

Mr. J. A. Ruddick : I would like to thank this committee on behalf of my own department, and on behalf of the cheese-makers in some of the other Provinces, for some very good work which they did for them in connection with this exhibit. Some of the other Provinces, particularly Prince Edward Island and Quebec, desired to exhibit at the Pan-American, and they laid the matter before our department at Ottawa ; but, as we had not made any arrangement for undertaking any work in connection with the exhibit, Mr. Hately very kindly offered to look after these exhibits for us, and it saved us a great deal of trouble. I am sure the work was done as well as it possibly could be done, and I would just like to thank the Association and this committee for the way in which they handled these exhibits for the other Provinces.

Mr. Harold Eagle : As a member of that committee I am sure the thanks of all of us are due to the Dominion Department of Agriculture, and especially to Mr. Ruddick, for the assitance given us ; and I also wish to thank the exhibitors for the magnificent way in which they responded.

ONE DAY CONVENTIONS.

You are aware there was a committee appointed from the floor of the House to receive applications from the cheese and butter men or dairy men to have local conventions held throughout the country during the month of February, and I will now give you a report of what has been done.

Report of Committee on Local Conventions.

Your committee appointed at the opening session to receive and consider applications for Local One Day Meetings, with instructions to report to this session, beg to submit the following report:

1. Applications have been received for meetings from Lyons, Birnam, Henfryn, Ingersoll, Stayner, Chatham, Villa Nova, Molesworth, Harriston, Welland, Strathroy, Pine River, Attercliffe Station, Gas Line, Lawrence Station, Pinkerton.

2. We recommend that the applications be granted by holding meetings at the following places. It will be impossible to provide in every case that meetings be held at the places from which applications have been received, but one of the places mentioned will cover the ground: Aylmer, Arkona, Atwood, Ingersoll, Dunnville, Stayner, Wallaceburgh, Waterford, Harriston, Strathroy, Ripley, Pinkerton.

3. We should also recommend that meetings be held at the following places, providing committees of suitable and responsible parties make applications in due time, and will become responsible that all the local arrangements should be carried out: Brussels, Drayton, Vittoria, St. Marys, Mitchell, Owen Sound, Flesherton.

All of which is respectfully submitted.

J. N. Paget, Chairman.
A. Wenger,
James Connolly.

Mr. G. C. Creelman: I was very pleased indeed to hear the report of this committee, to see what could be done to bring the patrons more closely in touch with the men who are manufacturing dairy products. I spoke of this for a few minutes last night, and I am very glad to have the oportunity this morning to go a little farther into the matter. We have at the present time in the Province of Ontario an organization known as the Farmers' Institute. We had some trouble in starting the Farmers' Institute in this Province, in getting farmers to take it up, and recognize it as their meeting, as you are having in bringing together the patrons of the factories. In the early days we had to go to the meetings and see a few people who were sufficiently interested to come out; but we realized that we were practically talking to empty benches. From that time the work has progressed, and now every one of you who are interested in the work in your own county know that to-day we have only to advertise an Institute meeting and send out competent men to address these meetings, and the meetings will be crowded, particularly in the evenings, to their utmost capacity. Last year there were present at our meetings 138,000 farmers, and while we must say that a great many of these people came out merely from curiosity, and partly to hear what the other fellows had to say, and partly to scoff, yet it is a hopeful sign that they will even come out for that reason. The proof of the pudding is that most of them get something that they take away, and while they do not always give the Farmers' Institutes credit for the good returns they get from the suggestions they hear at the meetings, nevertheless, they are better farmers for having attended the meetings, and whether the institute gets credit or not, it does not make any difference, the country is better for their having been there.

I feel that the Institute's work has got to the point now that we can, for the first time, do something in the way of a specialty. At first we had to put up a show. We had to have men on the Institute platform who were prepared not only to talk pretty good, but had to talk it so that it would be interesting, use illustrations and get people to come out and listen to them. Now that we had got them out, the next point was to

give them something a little more practical ; and the result is that he farmers now come to our Institute meetings, come for the practical discussions, and instead of our Institute speakers getting up and making long speeches, they get up, start the discussions and leave it to the men in the audience to say what they want to have discussed, and throw the meeting open. We have one man out this winter among the thirty-two who used to make a splendid address on "Foods and Feeding." He tells me this winter he simply puts up a chart, showing the composition of foods, and the way they may be combined to give the best results, and the farmers do the rest, and they go on and would talk the whole afternoon and in the night, if they were not called off for supper, so eager are they to get information along the line that will give them best results. The farmers are thinking as they never before thought. That brought us to the point where we can specialize. The audiences are assured, and now we want to give them what they want : weed out generalities and give them what is practical. I took the matter up with the directors, and especially with your Secretary, and we came to the conclusion that in Western Ontario we can have special Dairymen's Institutes. We have got the machinery, and we have permanent officers in the different ridings who are already holding meetings, and it seems unnecessary to go to work to establish another organization when we have one working quite well. Why not use the machinery already set in motion, and direct that machinery to work along the dairy line interests? I hold myself in readiness, with the members of my staff, as far as our means will allow, to send men to your factories to co-operate with your instructors. (Applause.)

I do not know that I need to say anything further. We have got to that point where we are ready to co-operate with you. We cannot do it without your aid. Unless the butter-maker is prepared to take up this kind of thought I will tell you they are going to go behind in their business. I had the criticism made in Whitby. When something of that kind was suggested they said, "Mr. Creelman, it is all right for you to preach that kind of thing, we have all we can do now in the factory. We are only paid $35 or $40 a month for the work we are doing, and we work hard, and we have no time for fooling with the farmers." Now, I can only answer it in this way : that the maker is just like the school teacher, who says he has not got time to teach the rudiments of agriculture when he is taking too much of his time teaching other subjects I say if the cheese and butter makers have not got time to devote to the man who supplies the factory, and give him personal attention, they have no business in the factory, and they are going to lose ground, and will not be in the business long. The young man connected with the creamery or cheese factory who will study the wants of the patrons and look after the milk as it comes into the factory, and size it up in his own mind and see what is the trouble, and will then go over to the patron's farm and go through his stables and tell him what the trouble is, that is the man who is not going to get $30 or $40 a month, but he is going to get more money and is going to be in demand for every factory in the country. If there are men in this audience who are prepared to co-operate with us, and take up the educational campaign, we are prepared to meet them half way, and I believe we have the whole country with us. I believe the time is come when there is no shilly-shallying about this. I can see it, because I go all over the country, and we have a demand for such men. The farmers want to see how you spray, how you graft, and how you bud, and want it done before their eyes. The farmer must have things brought close to his eyes. Let us have free discussion on these matters and go right after them, go out into the factories and hold meetings, and then we will know more about the business.

Mr. Brown : That is one of the questions I have been endeavoring to put into practice in my factory for the past five years, and I have accomplished a little, but the last two years it has taken hold, and I have put in an application for a local meeting. I am glad to see that the Associations are going to have these meetings. So much has been said about depression of the markets of the world in connection with our dairy products, that we are going behind, etc. I do not believe it. I think it is because others are going ahead so fast, and we must improve in order to keep up with the procession, and in order to do so we must look after little details, and go to the stables where the

milk is produced, because there is the place where the finest quality of this product is produced, or destroyed. (Applause.)

The Chairman: I have now pleasure in introducing to you Mr. Eli Bourbeau, who will give you an address on the work of the cheese instructors in Quebec. He is a very active man in his Province, and is carrying on a most magnificent work, and, as I have said, he has made cheese in England, and brought it to this country.

NOTES ON THE MEANS EMPLOYED BY THE QUEBEC DAIRYMEN'S ASSOCIATION TO TEACH ITS MEMBERS THE SCIENCE NECESSARY IN MAKING CHEESE AND BUTTER.

By Eli Bourbeau, St. Hyacinthe, Que.

The Quebec Dairymen's Association thought that the best means to be taken for the progress of dairying was to put within the reach of everyone interested in that industry the science that is necessary for the making of cheese and butter of first quality.

It has taken two ways to inculcate that science: the dairy school and the inspection of the factories.

Here is what it has done for the school: Even before its organization as an Association among its most active members it was admitted that the school was an absolute necessity. Messrs. Barnard and Chapais opened, in 1881, at St. Denis, Co. Kamouraska, the first cheese and butter factory in the eastern part of Quebec, and was at the same time favored with a bonus of $200 from the Department of Agriculture. It was the first dairy school established in North America.

The Dairymen's Association was organized in 1882. It opened a practical dairy school at St. Hyacinthe, which was operated until 1891. The same year the Association opened a practical dairy school at St. Hughes, and the next year it organized a travelling school. The same year the Association opened the present dairy school, which gives courses during the winter to apprentices and makers who are anxious to learn. In nine years 950 butter-makers and 1,319 cheese-makers, making a total ot 2,269 scholars, followed the courses, making an average of 252 each year.

I will now tell what the Association has done regarding inspection: In 1883 its inspectors (Messrs. Jocelyn, Barre and Archombault) visited 30 factories; in 1885 Mr. J. Painchaud, a former scholar of the St. Denis School, acted as official inspector for the Association; in 1887 Mr. Saul Cote, student of the same school, was named with Mr. Painchaud, and the next year (1888) Mr. J. A. McDonald was named with the two former, and they visited, during the season, 309 factories. In 1889 the Association began the organization of the syndicate. In 1890 three syndicates were organized, and the necessary funds were furnished by the Prime Minister of the Province of Quebec with the understanding that the Dairymen's Association would have the absolute control. In 1891 the syndicate was officially organized, according to rules made by the Association and approved by the Government. Ten syndicates were organized that year, the inspectors visited 242 factories and made 1,992 visits under the control of Mr. Saul Cote, general inspector of the syndicate. In 1892 Mr. Peter McFarlane was named general inspector of a syndicate numbering nineteen, with 307 factories, which received 1,838 visits. In 1893 the work of the organization of the syndicate was completed by the opening at the dairy school of special classes, theoretical and practical, for the candidates for inspectorships of syndicates, for which they are obliged to follow and pass a written and oral examination before a Board of Examiners appointed by the Association. The same year (1893) Mr. Cote was named General Inspector of syndicates which numbered twenty-seven. In 1894 your humble servant was named Assistant General Inspector. That year we organized twenty-eight syndicates and thirty-eight in 1895. In 1896 I became General Inspector

with Mr. J. A. Hamondon as an assistant, and Mr. J. D. Leclaire as General Inspector of the syndicate of butter factories, positions we have kept ever since.

Besides these three officers there are 42 inspectors of syndicates, and 5 who hold diplomas from the Association, are employed by the Department of Agriculture to visit factories that are not able to join the syndicate, which numbered last year 742, and the inspectors of the Association visited 840 factories, which makes a total of 1,582 out of about 2,000 factories that we have in Quebec.

Let me tell you now how these syndicates work. They were organized to obtain:

1st. Special attention for the reception of the milk, regarding the skimming, watering and taint.

2nd. Scrupulous attention to the keeping of the factory, regarding cleanliness.

3rd. The good condition and uniformity of the products.

4th. Keeping record of the reports that the factories are obliged to make each season to the Association.

The Province is divided into twenty divisions, and we can organize in each one or more syndicates of butter or cheese or both combined. Each syndicate cannot take more than thirty factories and not less than fifteen. Each inspector makes an average of seven visits to each factory each season, and receives a salary averaging $550, paid as follows : $300 by the Department of Agriculture, and $250 by the proprietors of the factories that join the syndicate.

The candidate inspector is admitted to the special courses, and has to pass the examination to obtain a diploma on the following conditions :

The candidate must notify the Secretary before the 1st of June that he intends to follow the special course. Then the Secretary gives orders to one of the General Inspectors to visit the factory in order to be sure of his capacity as a maker, and he must have been chief maker for not less than three years at a factory. He must also furnish certificate of the buyers that have purchased his cheese or butter during the last three years. If the candidate is found capable by the examination and the visit, he has a permit for one year. During that year he is frequently visited by the General Inspector, and if his work is considered good he gets a diploma.

At any time if the inspector does not give every satisfaction to the General Inspector for the Association the latter has the right to cancel the diploma given that inspector.

Every inspector is obliged, every three years, to follow a special course at the Dairy School.

I am sorry to say that although we are behind our friends in Ontario yet we are doing our duty for the improvement of the butter and cheese industry. One reason we are behind is that when the dairy industry began to spring up in Quebec it went rather too fast. Some years hundreds of factories were built, and with so many new makers we had to stay a little behind. It is ten years since we have secured this system of instruction that I claim is one of the best that can be organized, and since then we have made progress, and if we are not up to the mark with our friends in Ontario I hope we will be before long and that we will make just as good cheese. It does not do any harm to say so. Then years ago, when I first came to Ontario, I sold my cheese for 9 1-4 cents. I came to Brockville the next week and the market was 10 1-4 cents, and they sold their cheese for 10 1-4, making a difference of one cent. What is it to-day ? Your President can answer, because he knows the trade of our country. He is one of our buyers, and I may say we will keep him.

I must acknowledge there is a difference, too. I must say that we have cheese of the quality of the best made in Ontario, and the number of good cheese is increasing every year. What we have to contend with is small factories. When the gentlemen from Ontario speak of a factory they mean making eight or ten cheese a day. That is one of our good factories. I heard the remarks made by the Minister of Agriculture last night. I think they are the most solid remarks made by a practical man that I ever heard in my life, and if Ontario is still ahead of the industry we are pleased to know it. I must thank you for your sympathy in listening to me.

The Chairman: I think after Mr. Bourbeau's address you will agree with me that you are in very great danger of losing your prestige up here. With the system of instruction they have in the east, and the syndicates arranged as they have them, and the instructors educated as they have been, I feel that you need brushing up just a little bit to keep ahead.

MILK SUPPLIES—QUALITY, QUANTITY, ETC.

By J. A. Ruddick, Chief Dairy Division, Ottawa.

I understand I am merely to start discussion along this line. I realize, and have realized for a good many years, that this matter of securing a better quality of milk for the cheese and butter factories is one of the greatest problems we have in the dairy work.

It is a very difficult matter to get at the patrons whom we most desire to reach, and I am very glad to notice that you are making a move in the right direction in the way of holding smaller meetings throughout the country where you will have better opportunities of dealing with questions of that kind than you do at the larger meetings. I have had something to do with similar meetings of that kind through eastern Ontario during the present winter. We have had some of the most successful local meetings organized for just such purposes as you are arranging to hold during the next two or three months.

As this question presents itself to me there seem to be two classes of patrons who have to be considered. In the first place there are those who are in wilful negligence in regard to matters of handling milk, and who would be quite willing to take such precautions as were necessary if they only knew what was to be expected. It is not very hard to deal with that kind of man if you can get hold of him. Then there is the other class who are wholly indifferent, and who are not inclined to listen to reason or advice in any way, and these have to be treated in a somewhat different manner.

You have to convince a patron that it is in his own interest to furnish good milk, because by doing so you will enable the maker to produce a better article of cheese. You have to show that in as plain a manner as possible how the milk may be improved, and it is only by getting near the patrons in such a mode as has been proposed that we can convince them of the necessity for anything of this kind. There is just one point I want to emphasize, and then I will leave this matter for some one else to discuss. Ten or fifteen years ago there was a good deal said for the first time about the aeration of milk, and about that time a good many utensils were devised for that purpose, and cheese factories were especially advised to depend on the aeration of their milk rather than cooling it by any other means. I believe a good many of us were making a mistake in that direction in advising the patrons too strongly on that point. I am free to admit I made that mistake myself. I believe that has had a great deal to do with lowering the quality of cheese during the past few years. I think it was a mistake to advocate the aeration of milk and to depend on that alone to preserve the best condition for cheese making. I believe the milk should be cooled in hot weather. The aeration of milk itself does not prevent the milk from turning sour except in so far as it lowers the temperature. The difficulty is that in hot weather, when we need the cooling most, aeration has little effect. It depends upon the difference between the temperature of the air and the temperature of the milk, and when the air is warm there is very little cooling effected, and this is the weak point in depending upon aeration alone. I will say milk which is aerated without any change of temperature will sour quicker than if it was never aerated at all, because allowing it to go into the air in that thin stream allows the organisms that produce lactic acid and sourness to get into the milk.

Then there is another point in connection with aeration, that a great deal of milk is injured in flavor by being aerated in a place where the atmosphere is not pure or free from dust. That kind of areation is an injury to the milk rather than a benefit, and it is a very common practice to areate the milk in the barnyard or in the yard where the cows are milked. The milk should be removed from any such surroundings before areation takes place. During hot weather it would improve the milk for cheese-making purposes very much to have the temperature reduced by some other means—icing cans or using any means which will be sufficient to reduce the temperature. From a cheese-maker's standpoint I would say, I would like to have the milk arrive at the factory every day during the summer in sweet enough condition to allow you to use a good lactic acid starter. I believe that would be a great help to the cheese makers in producing a better and more uniform quality of cheese. A good deal has been said against the use of a starter. We never should talk against the use of a starter as a principle. No man ever made cheese without a starter in some form or other. It either gets there by chance or he puts it in. We must control its fermentation to some extent; you cannot make cheese without it, and it is nonsense to talk against a starter, as a principle. I am quite free to admit many use a starter that does not answer.

Last spring, at Ottawa, I had the privilege of preparing for the cheese makers and factory owners a bulletin entitled "Milk for Cheese Factories." This bulletin is prepared for popular reading, so that it may be distributed among the patrons, and we are glad to furnish every factory with a sufficient number to supply one to each patron. We also have one prepared on the "Milk for Creameries," and we send this out to any butter maker or owner of a factory who applies to the Secretary of Agriculture. We distributed 25,000 last year. We have a large number reprinted, and are prepared to supply these in any number that may be required.

Mr. T. B. Millar: Is it not a fact that the average patron, when he cools his milk, fails to aerate it?

Mr. Ruddick: I would not advocate that practice. I do think I would rather have the milk cooled during the hot weather than aerated and not cooled.

Mr. Millar: We find in this western country that if you cool your milk without aerating it you have the worst kind of milk to make cheese. I would certainly advocate cooling the milk after aerating. At the same time, we think cooling the milk without aerating makes it difficult to make first-class cheese. While I admit we must have some lactic acid to make cheese, I say a starter as it is used to-day has more to do with making of poor cheese than anything else. (Applause.) The over-ripening of milk at the factory, and using a starter that was not suitable, have done our cheese industry more injury than anything else. If we could educate our people to produce good milk, and air and cool it in hot weather, it would be better. We want it aired and cooled at the same time, and if they would do that in nine cases out of ten we would not want any lactic acid starter. Until we get some better way of making a starter and keeping it I say by all means do not use it. I find the maker who uses the most starter makes the poorest cheese. I can give you an instance where a maker was not making good cheese, and we went and threw his starter out and we said, "Don't use that any more this season," and from that time he made good cheese.

Mr. Ruddick: I agree with what Mr. Millar has said, but it does not change my view as to what I say about starters. The starters he refers to are not starters. The cheese maker who does not know any better than to use a starter which will make bad cheese should not be allowed to make cheese. The use of starter is very much abused, and I believe it is quite true that a great deal of bad cheese is made in that way, and we must correct the use of starter. Because a starter is a necessary thing we must have this fermentation which the starter produces, and it is better to control the fermentation by having these pure-flavored starters. I do not see any difficulty in makers preparing a new starter and propagating it from day to day.

Mr. MacFarlane: Can you give us any information so that we can get the milk and it will air itself?

A Member: I have had the same trouble that Mr. Millar has spoken of in reference to cooling and airing. I admit that cooling and airing are all right. The cooling is all right and very necessary, provided you get the air in along with it, but many of the farmers get the milk in a can and set it in a tub of ice water and that is the end of it, and the result of the whole thing is that the cream rises quickly and forms a scum over the top, so that the animal odors are imprisoned in that can of milk, and you have a combination of flavors that is far inferior to the simple animal odor that is left if it was aired and cooled. I have found that that is the very worst kind of milk to be manufactured into cheese or butter, because it is simply an impossibility after that odor has been imprisoned in the milk to get it out by any method that I have discovered. (Applause.)

Mr. Ruddick: I do not want to be misunderstod by anyone present, and that you should think that I would advocate cooling of the milk without aeration. I believe in the principle of aeration thoroughly, but I would advocate the cooling of the milk with aeration. That is what I meant to say if I did not make myself understood thoroughly I will do so now. If the patrons are not doing that there is no reason why we should not ask them to do so. There is no doubt in my mind that the aeration of the milk followed by cooling would have a beneficial effect, but in hot weather when you require to get the milk at a low temperature aeration will not cool it. Speaking of using starters, Dr. McConnell and myself, at Kingston, made some experiments in reference to the organism which produces that reddish color in cheese. We had cultures of this particular organism, and we were able to produce that effect on the cheese by these cultures, and by the use of a good starter we have been able to overcome all bad flavors in cheese.

A Member: I would be very much in favor of getting the milk cooled and well aerated, and using a starter. I think the milk should be ripened at the factory and kept cool.

Mr. Barr: I quite agree with what Mr. Millar says about starters. I firmly believe that the use of a starter has caused more trouble and made more bad cheese than any one thing in Ontario to-day, that is, the misuse of it. At the same time we know through the months of June, July and August, when we are making the most cheese, we are getting the kind of milk that is very hard to make good cheese out of. I think the only reason why we cannot make a good cheese out of this milk is because it comes to the factory over ripe. I have been an advocate of cooling the milk, along with aeration, for a number of years. I do not feel like getting on the platform and advocating it strongly because I knew a great many of the makers did not agree with me. I think we have come to the point when we have got to have milk in a better condition with regard to lactic acid or ripening of the milk when we get it to the factory. We should make our very finest cheese in June, July and August, and we find we cannot make this silky cheese for the simple reason that we get the milk in such a condition that it works too fast, and we cannot handle it. We should tell the patrons that they will have to deliver their milk in a sweeter condition, and then I do not think you will require to use a starter. At every factory I have gone into this summer that was the one condition that was wrong and almost the only one. We find the flavors the biggest trouble with the cheese, and when we make them from over-ripe milk, and the makers do not know how to handle that over-ripened milk to the best advantage. If we could get the milk to the factory in a sweet condition I do not think there would be any trouble in educating the makers to produce good cheese. We must get our milk to the factory sweeter, before we will make a large number of cheese as silky and good as we should. (Applause.)

Mr. Steinhoff: Following the statement of Prof. Harrison along the line of investigation he has made, I think there is the one point we ought to take up, and that the influence of this Association ought to go in the direction of the improvement in the cleansing or washing of the cans. Prof. Harrison made it very clear that this bitter flavor coming in the can after going through the ordinary process of washing, is not cleansed of it. We ought to be able to do something in the way of

improving in that particular matter. One of the men who applied for one of these small meetings said to me that one of the reasons for wanting it was the practice they had of handling the cans in that neighborhood. They do not return the whey in the cans, but the cans are taken home by the milk drawer not washed, are kept by him all day, and then taken in the morning. He distributes his cans as he goes down the line. They are then washed and the milk put into the cans as soon as he returns. These cans cannot be thoroughly cleansed if this bacteria is so hard to get out of the cans. I submit it is a very important matter, and we should adopt some means of having them specially cleansed.

Mr. Brown: There is one point I would like to speak of. I would like to ask Mr. Ruddick if he has found any definite information with regard to what is known as "goose flavor" in milk. It is a very common thing, and one of the worst flavors makers have to contend with. I have my own opinion in regard to it, that it is caused from the cows having access to pools in their pasture fields that have been scooped out for the water to settle into instead of furnishing the cows with good fresh water. My reason for thinking so is that in our section I meet with it after an excessively dry time.

Prof. Ruddick: I am not acquainted with this flavor. The water that a cow drinks having any effect upon the milk is a disputed point. I think the contamination is very often in a direct way. The cow tramps into these places and she carries off on her legs and udder and tail and flanks particles of mud, which dry up, and at the time of milking these small particles of mud fall directly into the milk pail. There is a direct infection in that way, and it is one of the most serious things. Of course, scientific men say it is an impossibility for any living organism to pass through the cow with the water she drinks. Of course if the water is impure the health of the cow will be affected, and the milk will be affected in that way.

Mr. Brown: I think it is an exaggeration of stable flavor.

A Member: I was in England last summer, and found there that they do not cool the milk, and they do not air it. I am not saying it is bad, I am just telling you what they are doing, and although they do not cool or air the milk they have the best quality of milk. Why? Because the man that milks the cow takes every precaution. The udder is thoroughly brushed, the milk pails are washed with cold water, and then with warm water, and then passed through steam. The vat in which the milk is put in the factory is also washed with cold water and warm water and then passed through steam, and I think if every patron would take these precautions it would not be necessary to discuss airing and cooling. (Applause.)

Mr. Sullivan: I have attended many of these meetings. I am not a cheese maker. I am a salesman, and I am glad to see the turn things have taken here today. Do you know the speakers generally have a habit of dinning at the farmers for not sending better milk to the factory. I have always contended that was useless as very few farmers attend these conventions. Hundreds and thousands of farmers do not know anything about these conventions unless they read the reports in the papers, and I always thought that these small meetings should be the place where these matters should be discussed, so that the farmers would know what was really necessary. Talking about cooling the milk, one-half the farmers never cool their milk and never air their milk. They feel proud to think they have got the cows milked when the milkman comes along to receive it. (Applause.) The drawer has to be at the first stand at six, and you know how troublesome it is for a farmer to get up and milk eight or ten cows by that time. I have always advocated that the cheese maker is the man who knows what is wanted. Knowing every patron who sends bad milk he should send it back. Half the cans are not fit to put milk into simply because the tin is all worn off them and they are only iron; and what will give a worse flavor to milk than that? I have always contended that milk sent to a factory that is not in proper shape should be sent back, even if it is owned by a man who keeps twenty cows. If his milk is not fit for making cheese what is the use of dumping the milk into a vat and spoiling the whole lot? It is running the risk

of spoiling that batch of cheese. But a maker does not like to send it back for fear the patron would be offended. Every cheese maker should be an expert, and should go around and see every patron once or twice in the year and tell them what is wanted. It has been stated here that our cheese is going back. I do not believe it. I believe we are making a better cheese to-day than ever we made, but I believe the competition is greater, and there is no doubt we have to exert ourselves and make a better article. What did we see here yesterday at the exhibition of cheese. One man sent cheese that the judges said if he had ever tasted it he would never have sent it here. Why should a cheese maker send cheese here that had a bad flavor? We have experts going around the country. A man comes to our place and buys the cheese. He has never seen it before he goes out to look at it. He says it is all right and takes it. Maybe next time some other buyer comes and he says, "Something wrong here." "Well, what seems to be the matter with it?" "These cheese have not got the natural quality," and he puts them to one side. Then the salesman says, "Take what are right and leave what are not right." Then the buyer says, "They all have the same trouble; we cannot take them unless you make a reduction." Finally he gets the cheese-maker persuaded that he will lose something on the cheese, and the poor cheese-maker has got to suffer and make up the deficiency. I claim that is wrong. I claim every cheese-maker ought to know just as well as that expert, and if he cannot tell what is wrong with them then he has no right to be in the factory. They have these dairy schools to go to. They can spend a month or two months there to the very best advantage. A man who has been thirteen or fourteen years in one factory could learn something in any one of our dairy schools.

We have experienced more trouble this year with cheese than any other year, because a great many factories were not prepared for the hot weather. Cheese were selling at 9 1-2 and 9 3-4, and they offered us 8 1-4 week after week for September and October cheese. Talk about compelling salesmen to sell on the board and nowhere else. There were all these two months cheese, and I do not suppose a thousand cheese were sold on the board; but they got the man in the fence corners to buy the cheese.

Mr. Smith: Do you suppose it is necessary to cool the morning's milk?

Mr. Ruddick: When speaking of cooling I referred to the evening's milk. The morning's milk should be aerated just the same as the evening's milk, and that aeration will cool the the morning's milk sufficiently for all purposes.

A Member: What system would you recommend?

Mr. Ruddick: Any system. Fully expose the milk in a pure atmosphere in a spray or film or by pumping air through it.

A Member: Do you approve of cold water for cooling the milk?

Mr. Ruddick: Certainly; if I cooled it that is what I would use. If you had ice convenient you could use a small quantity.

A Member: That has been condemned in our section. It is claimed that the cold water cools the milk very suddenly, and that you retain any germ in it, and that it develops again after it is heated up.

Mr. Ruddick: We advocate the airing and cooling of the milk during hot weather.

Mr. Bell: What temperature would you advocate cooling the milk to in hot weather?

Mr. Ruddick: Milk will keep better at 70 degrees under certain conditions than it will at other times at 65 degrees. You have simply to be guided by the conditions.

Mr. Bell: I find that at 70 degrees it keeps very well, and that seems to me a very good temperature.

Mr. Ruddick: What are your views with regard to cooling the milk?

Mr. Bell: For ordinary work in the factory, keeping milk over night, I advise cooling and airing at a temperature of 70 degrees. If the vessels are cleaned properly I find that temperature quite low enough. For keeping a longer period I would cool it at 60 degrees.

A. F. MacLaren, M.P.: When I was judging in Chicago in 1893 I could have told 90 per cent. of the cheese that came from Canada if I had been blindfolded, because they were so much superior to the United States cheese, but at the Pan-American I find they were right up alongside of us, showing the very rapid progress they have made in the last eight years. Wisconsin cheese was in a very bad shape in Chicago, but at the Pan-American they had some of the finest cheese there. And the same with the Michigan cheese. At Chicago I never saw so much trash in my life as the cheese that came from Michigan, but they have improved very much, and the New York cheese was also very fine. I want to warn the Canadians that if they want to keep to the front they must make progress and not let these people pass us. They are making desperate efforts to get our trade. We must improve the quality of our milk and cheese and to do that we must get to work.

A PRACTICAL CHEESE EXAMINATION.

The Chairman: We will now pass around this cheese, the two kinds that came from Guelph. The one was put into cold storage immediately after being made, and the other was kept for three weeks, and then put in cold storage, and you can decide for yourself as to what effect cold storage has on cheese that is ripened at a cold temperature as advocated by some of the professors.

Mr. R. M. Ballantyne: It has surprised me that these cheese are of a meaty texture. I believed cheese put into cold storage immediately from the hoop would not ripen, and that they would stay curdy and would not be anything else until taken out and cured at a high temperature. I did not think it would be possible they would become good marketable cheese. These cheese, in my opinion, are not exactly like our summer cheese. They were made on the 26th day of August when the summer days are past, and when summer conditions do not prevail. I will read you a letter that I received from Professor Dean. He says: "These two cheese were made on August 26th last. The A cheese was put directly into cold storage from the hoops, and the D cheese at the end of three weeks. They have been in boxes for some time. They are not selected, but are the first two we struck when looking for the cheese to send to your convention. I trust that your members will enjoy them and profit by their examination. Should be glad to have any criticisms your experts care to make."

Now the cheese that were sent to Montreal were made on the 8th of July, six weeks before these cheese were made, that is, during the summer season when we get milk that is not so rich in fat, and when we have higher temperature, and when we have ordinary summer conditions.

The cheese sent to Montreal showed a much more marked difference between these put at once into the cold storage and those kept two or three weeks on the shelf. I feel that we have now reached the point when cheese has to be cured in cold storage, when the days of curing cheese at summer temperature in an ordinary curing room are passed.

Mr. T. B. Millar: When you say cold storage do you mean a temperature below 60 degrees or below 40 degrees?

Mr. Ballantyne: My own feeling about it is that a temperature low enough to control the conditions of the atmosphere is sufficient. I would say a temperature of probably 40 degrees was better than a temperature of 60 degrees for this reason, that at a temperature of 40 we do not have evaporation, and we keep the moisture in the cheese, and because the cheese kept cooler do not develop the bitter flavor we were afraid they would develop. The cheese held at the temperature of 65 degrees lost their nice mellow character, and became dry, became such cheese as we generally use in winter time from being held in cold storage during the summer. We hold

great quantities in cold storage and take them out in the winter time, and we expect they will be dry, so we expect to sell them for much less per hundred weight than September cheese. You will notice these cheese have none of that dry character, and the cheese made the 8th day of July, put immediately into cold storage and shipped to Montreal in the fall of the year, had none of that dry character, and were as nice cheese as the September cheese we had in our place.

A Member: How long were they held in cold storage?

Mr. Ballantyne: I think about three months.

Mr. Millar: That will be one of our troubles, the patrons will not want to have them held so long.

Mr. Ballantyne: We are making cheese in six months to be consumed in twelve months, so that necessarily some person must speculate on these cheese. A large quantity of the early make is put into cold storage. I do not believe the trade would adapt itself to the change if you all do it, but if you do it gradually the trade will adapt itself to it. There is not much difference in flavor in these cheese that are being passed around, but there is a marked difference in texture. The cheese put into cold storage at once have more moisture than the cheese put in at the end of three weeks and the difference is in the moisture. The difference we found at Montreal was both a difference in moisture and a difference in flavor. There was a very marked difference in texture.

Mr. Steinhoff: Might not that difference be due to the consistency of the cheese when made?

Mr. Ballantyne: These cheese that are being passed around to you were out of the same vat; both made from the same curd. The cheese we had at Montreal were exactly the same way. They were made from exactly the same curd, cheese from the same vat and same curd, so that they are not in any sense different cheese.

Mr. Millar: What is your opinion of the cheese held one week?

Mr. Ballantyne: Cheese one week in the curing room and then put into cold storage were very slightly different from the cheese put in immediately from the the end of one week and those put immediately into cold storage. The cheese that are put into cold storage immediately do, at some time of their existence, lose the surplus moisture of the outside, so that there is not much difference in that respect. After the moisture that the bandage holds is evaporated the cheese itself begins to evaporate, so that I do not believe a temperature of 65 degrees for one week would make much difference, but when you go beyond that period it does make considerable. The cheese held showed a marked difference.

Mr. Millar: There was a marked difference between cheese put in immediately and the cheese put in at the end of two weeks and the end of three weeks.

Mr. Steinhoff: There was no difference between cheese put in at the end of the week and those put immediately from the hoop.

Mr. Ballantyne: You could not see any difference?

Mr. Millar: That might be due to something in the cheese.

Mr. Ballantyne: I would not judge so, seeing that they were both out of the same curd. These cheese that were put from the hoop into cold storage were judged by experts in Montreal. About half of the men who scored these cheese were inclined to think the cheese put immediately into cold storage had too much moisture as compared with what they generally understood to be the proper consistency of cheese. The people generally like a moist cheese, and that is really the position of the consuming public, but the idea is this, that a buyer who buys a moist cheese buys a cheese that will go wrong in flavor early, because the moisture makes conditions favorable to the growth of bacteria, not because they are too moist for eating, but because they are too moist to keep.

Mr. Millar: Cured at too high a temperature.

Mr. Ballantyne: These same men said the cheese put in at the end of three weeks were too dry.

Mr Millar: I tried an experiment along this line myself. I took shipments

hoops. It was exceedingly difficult to make any distinction between cheese put in at of cheese two weeks old, made in the first half of July, put them in store for a week or ten days, and then shipped them out, and I had very good reports of them. I know very well that if I had kept them in the factory I would have had very bad reports, because it was excessively hot weather.

Mr. Ballantyne: In the east we have conditions that you do not have here at all. Instead of the buyers going to the factory and inspecting the cheese they buy it, and it is shipped to Montreal immediately after purchase. The salesman says, I have so many cheese on the shelves, and the buyer, anxious to buy them, buys all he can get. In many cases we buy all the cheese in the factory, and as soon as they are bought they are shipped to Montreal, where they do not wait for the buyers to inspect them. We get cheese in there that you cannot break down under the thumb. We still pass these cheese on and put them in cold storage, and they come out and give the best satisfaction. I always believed before that you had to cure the cheese on the shelves if we were to have good cheese when cured, but my judgment on that point is entirely changed. I believe that cheese have to be got away from the factory green and put into the cold storage.

The Chairman: I believe in cold storage, and I wish we had more of it through the country.

Mr. Steinhoff: The makers in this district say that they will have a great saving, because in the spring they will have cold storage right in the curing room, and they will not need to burn so much wood.

Mr. Ballantyne: The same thing exists in the spring as in the summer. When you bore cheese, you will find the middle of the cheese at a lower temperature than the temperature of the room, so that the temperature must decline to the point that keeps the cheese at a lower temperature.

DEVELOPING THE CANADIAN BACON INDUSTRY.

By F. W. Hodson, Dominion Live Stock Commissioner, Ottawa.

I am very glad to see the ladies present, as I think they have a great deal to do with this question of butter and cheese making. I think it is the duty of every man who owns a cow, and every woman, and especially those who have several, and whose livelihood in part or altogether depends upon the product of these cows, to be at meetings of this sort, none of us can afford to be absent. A great many persons say they cannot afford the time and expense. I am one of those who believe that we cannot afford to stay away. We should be here to listen and pick up crumbs of information, and take them home with us, and digest them thoroughly and apply them to our business. It is not enough for us to come here and listen and criticize, and you know that we as farmers are prone to criticize. We have come to the Farmers' Institute meetings, or meetings of dairymen, or fruit-growers' meetings, and we listen to what the speaker has to say, and we wonder who he is and what he knows about the business, and whether what he says has been gotten out of books, or from experience, and we talk about men as being book-farmers, and farming according to book. That kind of criticism is passing away, and we want to dismiss that kind of thing from our minds altogether. We want to stop critlcizing the speaker and learn all we can from each other. Pick up these crumbs; do not swallow them whole, but digest them. Weigh them carefully and when you get home think about them, and talk to your neighbors about them, and talk to your wives and children about them. Put them into practise and try them, and apply those that are applicable to your own business. You know there are certain dairy practices that may be good for you and not good for someone else. There may be breeds of cattle that will suit your farm exactly, and that may not suit some other farm as

well. Think about these things, and take them into your consideration. Do not be prejudiced agains things because you do not know all about them yourself.

I consider that not only men who are dairymen and farmers should attend these meetings, but citizens of towns and villages should attend them also. Why ? Simply to learn all they can about what the farmer requires. We do not realize as we should that our store-keepers and professional men, lawyers and doctors and even ministers are dependent on the prosperity of the farmers. If there are not any ministers here to-day there should be, for every man has an interest in the growth of agriculture and in the education of the agricultural class, because on them the wealth of the country depends. The newspaper man, the doctor, the merchant, the lawyer and the store-keeper is prosperous if the farmer is prosperous. Why was it that a few years ago our wholesale houses failed ? Why was it that our country merchants were pushed to the wall, and everybody felt the depression? It was because the farmers were not prosperous ; were not as prosperous as they should be ; old grain-growing days were passing away. We did not know as much about dairying and stock-raising as we should. Perhaps that would not apply as much to this district as to some others, but a great depression came over agriculture, because a change was coming in, and all classes of men, professional and otherwise, felt it. It was a useful lesson to them, that they might know that on the success of agriculture depended the success of all classes of the community. This is an actual truth, and let us realize it, and let us publish it, and let us rub it into the professional men and merchants, so that they will take an interest in agriculture and the education of the agricultural classes. The well-being of the agricultural classes is the greatest safe-guard to this country. That is the one thing we require above all others, and farmers themselves have it, in a measure, in their own hands. We have the right to demand that we should receive the co-operation and help of the rest of the community.

I said I was glad to be here, because I have a chance to pick up information, because I am not only a Government official, but I also am a dairyman, and I am a farmer and have been all my life. I am the son of a farmer, and have been for a long time a dairyman, and for that reason I am glad to be here. I will tell you why I came here. In the first place I came to bring apologies. I do not like to make apologies; that is one of the things I think a man ought not to do from a public platform, but in this case I cannot help myself. At the eleventh hour, just before dinner on Monday, I was told to come before this meeting and express the regrets of the Honorable Sydney Fisher, Minister of Agriculture for the Dominion of Canada, who is our Farmer Minister of Agriculture. He himself is a successful farmer and a successful dairyman ; a man who has fed his own cattle and fed them successfully, his dairy products gain the highest prices at Montreal. He takes a very great interest in associations of this sort, so great an interest in fact that he attended the late Convention for a whole week in Guelph, this year and also in previous years. He was present at the Eastern Dairymen's Association. He was present at the meeting held in Amherst, Nova Scotia, and he is a useful man at these meetings, because he always does all he can to make the meetings he attends a success. But on this occasion he could not be present, and he regretted it very much. Business in connection with the Cabinet, and in connection with the trade in South Africa, prevented him from coming here. A very large quantity of agricultural products are being shipped from St. Johns to Africa, and Professor Robertson is required there at this time, else he would have been here.

I think I can do nothing better than take up the thread of your discussion ; beginning with the words dropped by Mr. Pattullo, when he said that he would like to see central curing stations built and the curing rooms at the factories equipped as audience halls. This is the keynote to success in dairying ; to greater success than we have had before. We must have these meetings, and they must be made as educational as possible. Patrons must discuss at these meetings questions of importance. Do not talk about a lot of things and then not do them, or say anything more about them until you come back to the next gathering. I think you can have a monthly meeting in every cheese factory where you can discuss, with the patrons, those things which come before

the maker during the month. You all know that the farmers want to do the best they can. I want to manage my dairy herd as well as I can ; I want to make every dollar out of it that I can, and if it is going to hurt the product through anything that I am doing then I do not want to do it. The makers do no get close enough to the patrons. Why don't they ? I believe the makers are very frequently good men, and they mean to do right, they are public spirtied men, but they do not seem to have the time to meet their patrons as frequently as they should, and some of them are afraid to call a spade a spade, and an axe an axe. It does not do to be rude, but at the same time we must have the courage of our convictions, and state actual facts without varnishing them. Not only should the butter-maker and cheese-maker do their work exceptionally well, but they should be centres of information from which the patrons can draw inspiration. Every cheese-maker should try to have the best informed lot of patrons he can get. If a bulletin comes out he should get it and scatter it among his people. The education of the patrons is one of the chief works of every Institute Secretary, and of every cheese-maker ; he should be a centre of information.

I do not believe dairying can be made as profitable as it should be unless you work up the by-products. Denmark is working them up, and Ireland is working them up through their bacon hog, and their poultry, and their honey. I can only deal with one of these things, and what I say in connection with one department will apply to all others, I will take up the case of the bacon hog in connection with dairying.

How are we going to produce the best sort of bacon in this country ? Simply by informing our patrons of the requirements of the market. How are we going to get that information to the patrons ? That has got to come through the Farmers' Institute lectures and the makers in cheese factories and in creameries. How are they going to get that information to the patrons ? Simply by learning it themselves. They must learn the requirements of the market, and if it is Wiltshire sides that are wanted in the old country, or a particular class of hog, then the makers of the cheese factories must be well informed. He must know the requirements of the market, and he must know the kind of pig that will produce that bacon. How is he going to learn that ? The Minister of Agriculture for this Province holds an illustrative Farmers' Institute meeting at Guelph annually, known as the Provincial Winter Fair, and I believe every maker in this country should attend, whether man or woman. A number of you gentlemen do go to that Fair, but some of you do not, and I will tell you in a few words what is done there. In the pig department, and the same in every other department, the cleverest men in the bacon industry are brought there to judge the pigs alive. They judge them before the audience, and after the judging is done these men are asked to give their reasons for awarding the prizes, and after that is done and the discussion is finished, these animals are killed and dressed and judged again by the bacon curers, and they are again asked to tell the audience why they award the prizes as they did. This work is not all perfectly done, but is being done better and better each year, and a great many people are going there to see and hear, and I think all the cheese-makers should come to that meeting, and, further, I think they should go to the packing house and see the sorting done, and follow the animal through the slaughter and into the salt, and learn all the facts connected with the business, and communicate these lessons to their patrons, so that they may be well skilled in raising bacon hogs. If they would do that our bacon industry would improve more rapidly.

How are these men going to afford to do this ? I do not think there is a cheese factory or creamery in this country that cannot afford to send their maker to learn these lessons. They can afford to pay their expenses and wages. You should treat these men liberally. Take any great commercial house in this country, and you will find they do all they can to develop their clerks. I believe there are men who do not believe in this sort of doctrine, but I know it is the right way; I know it is the only way we can put Canadian products in the high place they ought to occupy in the markets of the world. In order to get bacon of the highest quality, it is necessary to have pigs of the right quality, and to feed them properly. We have got to have pigs bred properly and fed properly, these two things have to go hand in hand. You can spoil the best pig on

earth by improper feeding, but you cannot make a pig that is wrong into the right kind of a pig by any kind of feeding.

A good many people believe the only way they can produce the right kind of a pig is by crossing and intercrossing the breed. That is all wrong. Get one sort and stick to it. Do not breed Berkshire this year and Yorkshire next year and Tamworths next year, but take one breed and perfect it. You can get as good bacon in that way as you can by crossing and intercrossing; the same way wtih your dairy herd; if you are breeding Holsteins, continue in that line; it is not necessary for you to breed from pure bred females. If you buy pure bred males of the right type you will be successful and you can model your animals almost as you please; you can make them what you will if you use the right sort of intelligence.

I have been asked by some to describe the right sort of pig. I do not think it is necessary for me to do this to-day. I think you have heard of the right sort of pig a good many times; if you have not you will soon learn by attending some of the Farmers' Institute meetings or by going to the slaughter house at Ingersoll or elsewhere. It costs the farmer no more to produce the right sort of pig than it does to produce the wrong sort. I have heard it said time and again that the big fat pig is more cheaply produced than the bacon hog. That is not true. Experiments have been made that prove that the pig the pork-packers demand can be produced just as cheaply as any other. The right sort of pig will produce as much bacon from the food consumed as any other. If we persist in feeding these big fat fellows we will come in competiton with the American pork. In the United States pork can be produced more cheaply than it can be produced here, and if we go into competition with the Americans we will have to go out of the business, because we cannot produce fat pork as cheaply as they can. The custom over there is to put one steer in a corn field, and with each steer turn in four pigs, and the pigs follow the steer and pick up the corn that the steer knocks down. That kind of a pig will not produce the sort of bacon that make the Wiltshire sides, and Canada, Denmark, Ireland and a portion of England have that trade largely to themselves.

When I was in the old country this summer I saw a great deal of bacon that our product comes into competition with. Our bacon will sell for more a pound than the American, but if we persist in producing fat pork we will come in competition with the American, and also with the Russian. We are sending an exceedingly good product to the old country, and our bacon has a good name there, but at the present time we have come up against a serious question; our farmers are selling their pigs too light and too thin; a great many pigs being put on the market before they are finished. Last week eighty per cent. of the pigs received by one of our largest packers were numbered two and three bacon, and only 20 per cent. numbered one, simply because grain is high and the farmers are selling their grain and pigs, and making a little more money out of them in that way. The packers are losing about $1 a head on these pigs. Who is going to lose this money by and by? It will come back on us; I think it a very great mistake for farmers to put a product on the market to be exported or to be sold on their own market that is not of the highest grade; we should put on the market the best class of goods in the best possible way.

That brings me to another point, and that is this: that we as farmers wish to obtain the highest price from the drovers for our pigs and for products that we have to sell. When we deliver the goods our responsibility does not end there; we must go further than that. It is very much to our interest as producers that our products should be put on the market in the best possible condition. We cannot afford to let drovers and others abuse our goods; we must insist that they are landed in the old country in the best conditon, because this means dollars and cents to us. We do not realize the effect of this as we should; I did not realize it till I went to the old country last year. Another thing the farmers should consider, and that is that the goods must be put on the market in an attractive way, because that means a greater demand for the goods and a growing market. If we put our goods on the market in a sloppy way, it does not matter how good they were originally, it will mean a loss of trade. A growing demand means dollars and cents to the farmers, and if the demand is not good it means a loss to both the

buyer and seller, and if the buyer makes a loss to-day we have to make that up by and by, or they have to go out of business, and that means a loss to the trade. I think it should be the ambition of every butter and cheese maker to see that only the best butter and cheese comes from his district, and also that the best pork and the best fowls and other products that come as a by product from the dairy. It should be your ambition to see that these things are the best that can be produced.

What is the outlook for this bacon trade. If we produce the right sort of pig, we are bound to increase the trade, I believe we are rapidly gaining on the Danish and the Irish. At the present time they are getting the highest prices. They are going to no end of trouble to produce the right sort of pig. Our dairymen must produce these pigs, because you cannot get as good bacon in any other way as from the by-products from the creameries and cheese factories. I think the outlook is very good. In the United States and Canada pork is high, and I believe for the next two or three years we will see the prices of the right sort of pigs high. The outlook for the farmer is good, providing we supply the right sort of stuff; but if we continue to put on the market unfinished animals we are going to see a drop. Packers are being punished to-day, and it will come back on us if we are not careful.

Mr. Ballantyne made a very fitting remark when he said: "This refrigerator car service we are getting is a good thing. It is a step in the right direction." It is not all we require; it has not been followed out quite far enough. We have not as dairymen followed it out as far as we should, because in starting a car from London to go to Montreal, before it gets to Montreal the ice is out. Mr. Ballantyne said we should have ice houses here and there along the line, so that these cars can be replenishd from time to time. This is one of the details. I hope that remark dropped by Mr. Ballantyne will be taken up by this Association and followed out, and put into practice.

There is another difficulty. These cars are filled with ice from the top, and the top doors are not locked, and in passing through the country the trains are side-tracked to let express trains by. I have seen agents at stations, and other men, climb on the top of the cars and take out pails of ice, and let in the warm air. It is a small matter, but it is one of the little flaws that injure the service much.

When I was in England last year, I noticed a great deal of Canadian goods being unloaded on the wharf, and I noticed butter and cheese on the wharfs far too long; some steps should be taken by your Association to bring this to the attention of the persons that buy on the other side. It is a cause in which you are interested. We may take good care of the goods here, but it is possible for them to be spoilt on the other side. But I am told there is not so much danger of spoiling cheese in this way, where they are properly cured. Another point that came up yesterday that I would like you to consider, is that of the time to hold your Convention. At this date each year there are Farmers' Institute meetings held all over the country. Last year there were some 800 Farmers' Institute meetings held, and 138,000 people attended them. Men are engaged as lecturers who are successful in the work. These men are attending these meetings now, and they cannot be at your Convention. Your dairy work ought to be brought into closer touch with the Farmers' Institute work than it is. The only way that this can be done is for this convention to be held some time when the Farmers' Institute meetings are not being held. Could your meetings be held in March or in November, before the Farmers' Institute meetings commence? Just a very short distance from here, Farmers' Institute meetings were held to-day and yesterday; these lecturers should have been at this meeting.

We have been fighting the packing-house men for years because they insist upon paying the same price for all sorts of pigs, a plan unfair to the farmer who sells fifty or one hundred good pigs if he has to sell at the same price as the man who produces an inferior article. But I learned at the station here to-day that they are paying for the hogs according to their value. That is encouraging to the intelligent worker. You buyers are not buying cheese on their merits. Why not? Why pay a level price for all cheese, good, bad or otherwise.

In the old country I learned that people sold 9-10ths of their stock by auction. A

man living near a town knows that every Saturday there is an auction sale of stock, and that he can buy or sell what he wants to buy or sell. He does not have to induce a buyer to come to his place and dicker with him. That is the one thing that drove me out of the beef-growing trade, because I had to dicker with a drover. Fifty or sixty years ago the English people began to sell in this way. All over England and Scotland there are markets where men can sell all they have to sell, from a calf to a bullock, from a lamb to a full-grown sheep, from a little store pig all the way up; they are put on these markets and sold by auction. This system has grown from year to year, and I see no reason why we cannot do this in this country. Two or three years ago we established auction sales for pure-bred animals at Guelph, Ottawa and Calgary. What was our reason for doing so? Hundreds of men throughout this country were producing first-class animals, but they did not produce enough to pay them to advertise. They are good farmers, but they are not good salesmen, and in order to help these men we have established these sales. Some of these men, when they sold their animals, very often sold to speculators, and they resold them at large profit. The secretaries of the Agricultural Societies all over Canada are buying more or less males for the use of their members. The same thing is done in Scotland, in Ireland, and in England; they are doing it to a great extent in Nova Scotia. How are these men going to buy them? I have known men who wanted to buy a pure-bred animal to spend half as much money looking for him as they paid for the animal. In order to bring these men together, Mr. Dryden, in his wisdom, allowed the Live Stock Association to hold sales in Guelph, where, on the 26th of February this year, there will be 80 pure bred cattle sold; also some pigs. At Ottawa, on February 12th, there will be the same number auctioned. Men who want to buy can see 80 animals together, and buy what they want. The plan is working very well, and I hope to see it established in all parts of Canada; not only for pure bred animals, but for all sorts.

There was a lot of matter of great importance in the paper read by Mr. MacLaren on transportation. What are you going to do with that paper? Are you going to let it lie over till next year? I think you should appoint a committee who will keep this matter going. Mr. MacLaren comes before this convention and tells you such and such is a fact, but you must go home and solve the matter. You should appoint a committee, with a secretary who means business; with a secretary who has got time to take it up and fight it out and keep at it all the time. I will tell you what occurred about ten years ago. I said the live stock men were of great service to the country, and it would be in the interests of the railway company to carry all thorough-bred live stock at half price. The breeders said it was a good thing, but never could be brought into effect: that the railways would not listen to us. I said: "If you will appoint a committee to go with me, I will go to-morrow and see." They did so, and we saw the railway officials. They said: "What can we do for you to-day," and we told them; and they said, "Do you think we are a pack of fools, and that we do not know how to run the railway." We told them it would be a good thing for them, that it would produce more export cattle of a better class. They said "Gentlemen, we have heard you, and we will take this matter into our serious consideration," and we did not hear anything from them. But that committee kept at work. I wrote a circular saying what I thought ought to be done, and what effect it would be a good thing for them, that it would produce more export cattle of a better class. I kept on pushing. The people thought I was wound up; I kept at it for seven years, and every year the railway men had me to badger them. At the end of that time we secured half rates on all pure bred stock, shipped from one point to another in Canada. (Applause.)

I tell you this, not because there is any credit due to myself, but to encourage you to stick to this work, to keep pounding away. Nominate a committee, and insist that they shall report to you, and appropriate funds for the work. Take this paper of Mr. MacLaren's and send it to every M.P. throughout Canada, and to every newspaper man. You have no right to ask the Government for anything until you have made public opinion. It is not right to ask the Government for anything until you have got public opinion with you on that point; but when you have brought pressure enough to bear, you

can make the railways do anything you want. The live stock men can go to Montreal and ask for almost anything, but when we first went down there they asked us: "Who do you represent." We could only say the Shorthorn Breeders' Association. By and bye we went back and we had two thousand men at our back who were willing to put up a dollar each to see the thing through. If you keep on you will be able to do the same as we did.

RESOLUTIONS.

Mr. Pattullo: Last year, in the proceedings of the Association, regret was expressed that the City of Toronto had not provided an adequate room for the dairy industry at the Industrial Exhibition. Having expressed that regret, I think we should also express our satisfaction that, through the efforts of Mr. MacLaren and others, they have now appropriated sufficient funds to erect a magnificent building, where our exhibits can be properly represented, and I desire to move that the satisfaction of this Association be expressed at the action of the City of Toronto, especially with regard to the equipment of the dairy building, and that the President and Secretary of this Association be asked to prepare a formal resolution in accordance with my motion, and that a copy of it be sent officially to the Secretary of the Industrial Exhibition and to the City Clerk of Toronto.

The motion was seconded by Mr. MacLaren, who said: I have been the biggest kicker about the accommodation the dairymen have had at the City of Toronto for the last number of years, and I have very great pleasure in seconding the motion. Toronto has done well in offering to put up a nice dairy building, and I hope every dairyman in the country will help to make the dairy exhibit a success. I have very much pleasure in seconding the motion. The motion was carried.

Moved by Mr. Ballantyne, seconded by Mr. Paget: "That the Secretary of this Association be directed to address a communication to the Honorable the Minister of Agriculture at Ottawa, asking him to take such steps as will insure a sufficient supply of refrigerator cars for shipment of cheese during the summer season, and also provide icing stations at shipping centres." Carried.

Moved by A. F. MacLaren, M.P., seconded by J. N. Paget: "That the question of transportation of Canadian products, through improvements in the canals and waterways, and in the St. Lawrence River, having been brought to the attention of this Association at its annual convention; this Association desires to express its opinion of the extreme importance of such improvements being made, in order that the Canadian producers may be placed in the very best position possible for competition with the producers of other countries for the British and foreign trade. And that a copy of this resolution be transmitted to the Honorable the Minister of Railways and Canals." Carried.

Moved by Mr. Eagle, seconded by Mr. Ballantyne: "That the members of this Association desire to place on record their high appreciation of the welcome and assistance extended to him during the period of their annual convention by the Mayor and Council, the President of the Board of Trade, and the Citizens of the City of Brantford, for the use of the Opera House and the City Hall, but even more so for their kindly courtesies." Carried.

The Convention adjourned by singing "God Save the King."

WISCONSIN EXPERIMENTS IN CURING CHEESE IN COLD STORAGE.

By Dr. H. L. Russell, Wisconsin Experiment Station, Madison, Wis.

The work which I have to report this afternoon is practically a continuation of the work which was presented to your body a year ago. We have been working upon the curing of cheese to determine if in some way we cannot improve the quality of cheese by varying in one way or another the method by which it is cured. Cheese differs so much from butter in that, when it comes from the vat, it is practically a worthless substance, and it only receives its value from a commercial point of view due to those profound changes which occur in what is known as the ripening process.

Experiments which we have been making have been with reference to the use of very much lower temperatures than those heretofore employed

In making these experiments a large mass of milk was taken, and from that was made a number of cheese under exactly the same conditions. These cheese were made all in one vat, so as to secure uniform conditions with reference to manufacture, and then they were placed at various ripening temperatures, ranging from 15 degrees Fah. up to 50 degrees Fah., at several different degrees of temperature.* Under those conditions, if we secure a very marked difference in the products it ought to be attributed to the ripening temperature, inasmuch as the manufacture was the same throughout.

Best Results at 30 to 40 Degrees.

Our experience has demonstrated that the quality of the product which was secured under those diverse temperature conditions was in general better the lower the temperature we cured the cheese at, with the exception of those cured below the freezing point; though in spite of the fact that it was kept below the freezing point, there was a fairly good cheese when handled subsequently after it was taken from the cold storage room. The cheese which we have found to be the most successful, that is, the best quality of cheese, were those which were cured at a temperature ranging from 30 to 40, or thereabouts; these were better than those at 50; the 50 were better than the 60; and this leads us to believe that the use of very much lower temperatures than have heretofore been considered advisable may be made with very considerable success in ripening cheddar cheese.

There are just a few points with reference to these cold cured cheese that I wish to call your attention to. In the first place, there is the question of flavor. The flavor of these cheese cured at these abnormally low temperatures is very mild. It is a pure, straight, clean flavor in every way, in spite of the fact that it is more or less of a popular opinion, I believe, that cheese cured at what we might call cold storage temperatures very frequently has a bitter flavor; these cheese we have never found, cured at temperatures ranging from 33 to 15 degrees, to possess a flavor which was abnormal. It is not so marked a flavor, but it is a perfectly clean, pure flavor, although mild.

Texture Wholly Satisfactory.

With reference to the texture of these cheese, in many respects they were, as Mr. Baer, who judged them, put it, practically perfect. Those cheese were thoroughly broken down, so that the texture was as satisfactory as could be asked for.

It is noteworthy that a comparison of the cheese from a physical point of view, in connection with the chemical analysis, shows that these cheese were not decomposed

* At the convention of the Eastern and Western Dairymen's Associations, as reported in this volume, much attention was given to the subject of curing cheese at a low temperature, and several speakers referred to the first experiments in this connection, as conducted by Drs. Babcock and Russell, of Wisconsin Experiment Station. It has been thought advisable, therefore, to reproduce from *The Weekly Sun*, Toronto, of the 5th of February, 1902, this report of an address delivered at the recent meeting of the Wisconsin Cheesemakers' Association, and furnished to that journal by Mr. Archibald Smith, of the Western Dairy School, Strathroy.

chemically, as far as their physical appearance would indicate. That is to say, physically, they are apparently broken down further than the chemical analysis would ordinarily lead us to expect.

With reference to the body of the cheese, they were close and meaty in body, except in those cases where excessive quantities of rennet were employed. We have used in these experiments two or three times the quantity of rennet ordinarily used, say, six or nine ounces; and in those cases the cheese, as they increased in age, had a tendency to become slightly open or loose. We have, I believe, the right explanation of this looseness, that it is due to the shrinking of the curd, due to the action of the rennet itself, the rennet causing a continual and slow but constant shrinking of the caseine mass, and, therefore, when these larger quantities were employed, there is a tendency of the curd to continue to shrink, and, of course, as it increases in age, this has a tendency to make it slightly open.

With reference to the color of the cheese, they were perfectly even in color, except in those instances where the body of the cheese was a little loose, in which case the color was cut around these openings. This, I should say, only happens in the case of cheese made with much larger quantities of rennet.

What are the White Specks.

There is one other characteristic of these cheese which is quite remarkable, not only from the practical point of view, but at the same time from a scientific point of view. In cheese cured at 40 degrees or below, there appears throughout the entire mass of cheese very small, almost microscopic, white specks. The nature of these I need not go into here in connection with this subject, that is still under investigation. These white specks are not apparent when the cheese is in the cold storage room, but when a cheese is taken out and warmed up these very minute white specks occur. At first we thought this was very serious, a handicap upon the appearance, these white specks, and that they would militate a good deal against the sale and the quality of the product; but Mr. Baer, in his work throughout the State, has had occasion to examine the product in store in different portions of the State, and he has found that more or less of these white specks is not at all uncommon; that, in fact, in most of the storage goods which he examined they were apparent. They are not readily to be noticed in the early stages, they cannot be easily recognized; in fact, we recognized them upon the photographic plate before we did with the unaided eye, and afterwards we found upon very close examination, that they were fouud to occur in all of that product. They have absolutely no effect upon the flavor of the cheese, and do not injure it in any way, except, of course, where they might be present to such an extent that it would cause a question in the mind of the consumer as to what they were. From the fact, however, that they appear in all cold storage goods, and they have not, so far as we know, occasioned any concern in the market—that is, buyers buy these goods and do not pay any attention to it—we are led to believe that the matter is entirely inconsequential; and, indeed, this appearance, these very minute points in the cheese, constitute, as it were, a trade mark of cheese cured according to this method, because they do not appear in cheese which is cured at 40 degrees and above, but are almost invariably present in cheese cured at 40 or below.

The Scoring and Market Test.

Now, the quality of the cheese, as found in the flavor, the texture, the body, and the color, is on the whole better than that of cheese cured under higher temperatures. These cheese have been examined by our own experts and by cheese experts who knew nothing whatever of the way in which the cheese had been handled, not only in Wisconsin, but Canadian experts and Eastern experts have pronounced them an exceedingly fine cheese, a good deal better than the market ordinarily produces.

Of course, in one sense, we are aware that it is rather unsafe to judge of the market value of goods in this class in comparison with the general market; but so far

as it is possible for us to give a commercial score to these cheese in comparison with a standard score, they have not infrequently ranked considerably, from a half to three-quarters of a cent, or even, I think, a cent a pound, more than the regular product.

Not only has it been found that the quality of the individual cheese itself was improved, but those ripened at higher temperatures, but there are other advantages which come from the use of this system. Take, for instance, the matter of flavor. I say that the flavor produced by these lower temperature-cured cheese is exceedingly mild, although the texture is broken down, and frequently it gives you a soft, mellow cheese, with a mild flavor, even though the cheese may have considerable age. It is possible to intensify the flavor of these cheese in a very simple manner. If these cheese, after they have been thoroughly ripened, physically entirely broken down, still have a perfectly mild flavor—if these are taken out and brought into a higher curing temperature, say 60 degrees or thereabouts, you can intensify the flavor to almost any degree you have a mind to. In that way it becomes possible with well-matured old cheese to get rid of those sharp tan flavors so liable to be with the ordinary manufacture. This is desirable, I believe. You may have a very mild, thoroughly broken down cheese, or you may intensify that flavor by this subsequent sort of curing process.

Assists in Securing Uniformity in Product.

Then, again, the question of uniformity comes in. It is possible to make a more uniform product. The daily complications are so great as to practically, in some instances, defeat the skill of the cheesemaker. With these lower temperatures it is possible to produce a very much more uniform product.

Then, again, there is the factor of the keeping quality of these cheese—they are slower in ripening, but they are a great deal longer in passing through what we may call the commercial life of the cheese, so that instead of the cheese reaching its best and then soon declining, these cheese are a great deal longer in passing through what may be called a marketable or commercial period. This, of course, is an advantage which is very evident.

Again, we have the matter of the diminution of losses in the ripening of cheese in the usual factory. Now, not only is the question of quality important—flavor, texture, etc.—as determining the quality of the cheese, but there is a loss due to the drying, the evaporation of the moisture from the cheese. This is much less usually with cheese cured at lower temperature than those cured at 60 or thereabouts.

Again, we have the matter of abnormal taints. We have found that where milks are slightly tainted to begin with the taint was not nearly so pronounced in that cheese if cured at 40 degrees as if it was cured at 60 or thereabouts.

Molding Prevented by Low Temperatures.

Then, one more factor is the matter of molding. The molding of cheese is, of course, a biological phenomenon, due to the sprouting of mold spores, occasioned by the development of the mold on the surface of the cheese, brought about with the proper temperature and moisture. Mold will invariably occur when the degree of saturation in the atmosphere reaches the maximum point, and under these conditions under the ordinary temperature at which cheese is ripened you have more of loss, or at least trouble from the molding of the cheese. We find that with cheese cured at 40 degrees or thereabouts these molds will not develop—they cannot grow because the temperature is too low for them to develop, so that those losses are to a large extent obviated by the use of those lower curing temperatures.

The Cost Side of It.

Now, there is a matter of expense to be considered in this process, because, in order to be able to cure cheese at 40 degrees or thereabouts, it becomes necessary to use some other than ordinary methods. There is increased equipment, and there is also the factor

of time to be taken into consideration. The ripening process takes longer to go through under such conditions ; therefore, the factor of interest comes in. It has been found that it is possible to diminish this extra time by the use of higher amounts of rennet, and that we do not get the disadvantages which come from the use of rennet under ordinary conditions. The use of six or nine ounces of rennet ripened with ordinary surroundings gives a very sharp flavor ; these cheese cured at 35, 40, and 50, after using the extra rennet, do not have that sharp and undesirable flavor, and at the same time it hastens the ripening process, so that the time element is not of so much importance, because it permits the use of the larger quantity of rennet under conditions where the disadvantages do not come from the use of this extra rennet, and while it is possible that it will take somewhat longer time than to cure cheese under ordinary conditions, yet that time is not very greatly increased. I have cheese ripened under those conditions which has been held at 40 degrees, and its entire ripening period is due to the changes taking place under those conditions.

This cheese here is made with three ounces of rennet and two and a half ounces of salt, and it is now seven months old. We went to Mr. Noyes' factory, down in Richmond County, and there secured the output of a whole day. These experiments were not experiments under laboratory conditions, where a mass of milk has been taken and worked up under experimental conditions. These experiments have been made on what you might call a commercial scale, and we have somewhere in the neighborhood of forty or fifty thousand pounds of milk which has been handled in this way, so that the conclusions which have been derived from these series of experiments, which now cover a period of something like four years, are entitled to more value than they would be if they had been confined to laboratory conditions. There will be an opportunity to test this cheese, and you can see for yourselves, perhaps better than I can tell you, what you think of the product, whether the quality of cheese which has been cured under these conditions is satisfactory or not.

Now, with your permission, I think the few words I have to say with reference to the other subject had perhaps better come in here before we cut the cheese.

Relative Advantages of Consolidated Cold Curing Stations for Cheese.

The experiments to which I have referred lead us to believe that if we use lower temperature than have heretofore been employed, we can secure better results, not only a better quality of cheese, but we can diminish the losses, which would otherwise obtain, and at the same time materially improve the conditions in other ways, so that from the dollars' and cents' point of view it is well worth considering. Of course, however, it is manifestly out of the question for each cheese factory to go to work and construct a curing room in which the insulation is perfect enough to enable us to secure a temperature of 40 degrees or thereabouts. Some years ago the proposition was made at the Dairymen's Convention with reference to centralized curing stations for the ripening of cheese. It seems to me that if this process is a success, that in place of each factory building its own curing-room and putting $500 or more into a sub-earth duct, or some sort of improvement along that line, that it is a great deal more economical for use to combine—co-operate—so that we may secure maximum results with minimum expense ; that it is possible for us to ship cheese from the different factories to some central point at which a properly constructed curing room can be made, which can be handled so that the quality of cheese will be much improved thereby. It is possible, not only to improve the flavor, but to diminish the losses in this way. There are other advantages to come from this production of the cheese in large lines, so that buyers can buy a considerable quantity of it at one time. In this way it is possible, through the use of this consolidated cold curing station, where cheese is shipped from various points to be cured, to produce cheese under the minimum expense. These cheese can be put in right directly from the press.

Experiments in Shipping.

The experiment has been tried of shipping cheese from Iowa to Canada and from Canada back to Iowa in order to see whether they would stand the journey without impairment in quality, and those cheese, sent six or eight hundred or thousand miles, have been placed under these curing conditions, and they came out A No 1 cheese, so that the question of distance is no factor whatever in this matter.

Now, this is a possibility for not only the consolidation of factories under one management, but it is also equally applicable to co-operation in any central locality of various factories. Here are twelve, fifteen, or twenty factories, receiving milk in contiguous territory, and in place of each one building an independent curing room and curing the cheese themselves under adverse conditions, this cheese can just as well be sent to a common source, where it can be handled better and with more economy, and it seems to us that with the inauguration of this cold curing type of cheese that the cheese industry of Wisconsin can be given an impetus forward which will put it in the front rank, where it can always stay.

A general discussion followed.

Mr. Aderhold: How about the rinds on those low cured cheese—as to whether they will stand up ?

Dr. Russell : There is rind enough so they stand up, and hold their shape, even though they are put in directly from the press. This cheese was put in from the press. It was brought from Muscoda, about twenty-four hours on the road, and put right into a temperature of 40 degrees, immediately after. The flavor can be materially increased in this cheese, but the point is that you get the broken down condition and the mild flavor and then you can intensify that flavor by development at a slightly higher temperature. In that way there is no liability to huff, the abnormal conditions to be avoided.

Mr. Michaels : Was there any color put in that cheese ?

Dr. Russell : No, this is an uncolored product.

Mr. Mason : Could you cure that in less than seven months ?

Dr. Russell : Well, I do not know. I do not think that you could get it as far along as it is in much less time. What do you think about it, Mr. Baer ?

Mr. Baer : I think not less than six months.

Dr. Russell : There was three ounces of rennet to the thousand pounds of milk used here. Now, you can hurry the ripening process by doubling the quantity of rennet, and you can do it in perfect safety ; you get no bad flavor in any way. You can use six or even nine ounces of rennet, as we have done in our experimental work.

REPORTS OF THE DAIRY SCHOOLS OF ONTARIO.

AGRICULTURAL COLLEGE DAIRY SCHOOL, GUELPH.

James Mills, M.A., LL.D .....Director.
H. H. Dean, B.S.A .....Prof. Dairy Husbandry and Superintendent.
G. H. Barr and R. W. Stratton..Instructors in Cheesemaking.
Mark Sprague.....Instructor in Separators, Piping, Repairing, etc.
Jas. Stonehouse .....Instructor in Buttermaking.
J. A. McFeeters.....Instructor in Milk-testing.
Miss Laura Rose.....Instructress in Buttermaking, Farm Dairy.
C. W. McDougall.....Instructor in Separators and Milk-testing, Farm Dairy.
F. C. Harrison, B.S.A.....Lecturer and Instructor in Dairy Bacteriology.
Wm. Gamble, B.S.A.....Lecturer and Instructor in Dairy Chemistry.
Mrs. Jean Joy .....Lecturer and Demonstrator in Home Economics.

The following is a brief report of the Central Dairy School in connection with the Ontario Agricultural College for the year 1901, and for the term from January 3rd to March 27th, 1902:

During 1901 there were 65 students registered for the twelve weeks' course from January 2nd to March 22nd, and fifteen for the three weeks Creamery course in December, making a total of 80 far the year. For the term of 1902, 88 students registered for the Dairy courses, and 96 for the course in Home Economics. In addition there was a special lecture on Cooking for farmers' wives and daughters at the close of the term, at which about 80 were in attendance, making a total of 264 students registered from January 2nd, 1901, to March 27th, 1902. If we add to this the large number who attended a few of the lectures in Home Economics, but who did not register, those who came to the school for a few lessons on the use of the alkaline test, best methods of arranging creameries, cold storages, advice regarding dairy appliances, etc., and also the special class in cooking, the attendance has not been far short of 350. We have a large number who come each year for some special information who do not register, and yet the Dairy School is of great value to them. This class of students do not appear in the list of those who receive instruction, yet they are largely benefited by the School.

The following counties, districts, etc., have been represented by students during the terms: The Argentine Republic of South America, Brant, Bruce, Carleton, Durham, Dundas, Elgin, Essex, Glengarry, Grey, Halton, Haldimand, Hamilton, Hastings, Huron, Lambton, Lanark, Lennox, Leeds, Muskoka, Middlesex, Northumberland, Norfolk, Nova Scotia, New Brunswick, Northwest Territories, North Dakota, U.S.A., Oxford, Ontario, Peel, Perth, Prince Edward, Quebec, Russell, Simcoe, Toronto, Vermont, U.S.A., Victoria, Waterloo, Welland, Wentworth, Wellington, and York.

The increased attendance of ladies is gratifying, especially is this so during the past term, when 23 ladies registered for the Dairy Courses, three of whom took the full factory course. The addition of a course in Home Economics has doubtless induced those who desire to know more about dairying, poultry and housekeeping, especially the economic preparation of foods, to come in larger numbers.

The large increase in the supply of milk for the term has been of great service in giving additional practical instruction. The class was also supplied with cream furnished by patrons who use separators or cream the milk by gravity. This cream was tested with the oil test churn and churned separately from the cream separated at the school. We were obliged to sell the butter made from this cream at from one-half to one cent a pound less than was obtained for the butter made from the cream separated in the school owing to its poorer quality. However, the students obtained a good deal of practice in the handling of cream as delivered at a cream-gathering creamery which compensated for any financial losses sustained.

The work of instruction has been carried on similar to that of last year. Instead of one week at practical work in the bacteriological laboratory, two weeks were given in 1902.

Instruction in piping, repairing tinware, leaks in valves, etc., has been given as usual, but we have lacked a special room for this work. It is our intention to provide a special place for this class of instruction in 1903, and to add the putting up of shafting and pulleys and the operation of an engine. Two students will also be detailed each day for instruction in firing the boilers at the school and in running the engine. It is also proposed to have an advanced class in cheesemaking in 1903. All students with more than two years' experience in cheesemaking will be put in a class by themselves under the charge of Mr. Barr, who will take up advanced work. If students wish to do so, they may take cheesemaking only, or combine with it milk testing and laboratory work in dairy, chemistry and dairy bacteriology. So much attention is now being given to butter that we are in danger of losing our hold on the cheese trade before we get the butter business properly established. This would be a calamity for the dairy industry. Experienced cheese makers may know that at any time they wish to come to the College between January 2nd and March 26th, 1903, they will find something of special interest for them in the cheese room. There is a danger of experienced cheese makers coming to the conclusion that there is nothing for them to learn at a Dairy School. We hope to be able to convince these men that there is yet a great deal to learn about cheese making. With Mr. Barr as instructor this branch of the School ought to be a great help to the cheese industry, which is in danger of suffering from indifference.

We expect to add a mechanical refrigeration plant to our equipment during the present year. We are also in a position to accept a limited number of students for practical work in both cheese and butter making during the summer months. There are already nearly enough applications to fill all our space for the season of 1902.

The Dairy School in connection with the Ontario Agricultural College was never in a position to more perfectly meet the demand for practical and scientific instruction in dairying than it is to-day, and we hope to make such improvement in the courses from time to time as will meet the growing demands of dairymen.

H. H. DEAN, Superintendent.

Guelph, March 29, 1902.

EASTERN DAIRY SCHOOL, KINGSTON.

G. C. Creelman, Toronto ..... Director.
J. W. Hart ..... Supt. and Instructor in Cream Separating.
G. G. Publow ..... Instructor in Cheesemaking.
L. A. Zufelt ..... Instructor in Milk-testing.
Robert Ireland ..... Instructor in Buttermaking.
D. M. Wilson ..... Assistant in Cheesemaking.
F. McGowan ..... Assistant in Buttermaking.
Thos Perry ..... Engineer.
W T. Connell, M.D ..... Bacteriologist.

For the year ending December 31st, 1901, the following report is submitted:—The number of students in attendance from the first of January until the close of the school April 3rd, was 68; from the period when class work was resumed on the 2nd of December, 24 students registered before the close of the year, making a total attendance for the year of 112.

With few exceptions the students reside in Eastern Ontario, and are regularly employed in making factory cheese and creamery butter during the summer months.

There are no special facilities here for students expecting to engage in home dairy work, although a few of this class attend. Were systematic instruction given along this line it would be a great benefit in improving the quality of butter produced on our farms, and it is to be hoped that provision may be made in the near future to meet the needs of those who are engaged in home dairy work.

During the long or Certificate Course, January 17th to February 27th, 1901, 25 students were in attendance in the cheesemaking department, while twelve took the course in butter making. In the examinations held at the close of the course fifteen wrote on cheese making, of whom ten passed, and seven wrote on butter making, six of whom were successful. Certificates of proficiency were given, six of the students who passed the long course examinations in cheese making, and who since that time have demonstrated their ability to manage a cheese factory successfully. Two certificates have been granted students who conducted creameries.

Milk was supplied by 64 patrons. The Clarified Milk Company of Kingston, Limited, furnished a large proportion of the milk used in cheese making. During the months of January and February it was found difficult to secure an adequate quantity of milk for the uses of the school, but I am glad to be able to report that the outlook is favorable for larger supplies in the future. The amount of milk received each month with the particulars of its manufacture are given in the following table:

Milk for Buttermaking.

Month.	Lb. Milk.	Average per cent fat.	Lb. Fat.	Lb. Butter.	Lb. Milk to 1 lb Butter	Lb Butter per lb of fat in milk.
January	34 700	4.33	1,491	1,639	21 11	1.10
February	40,846	4 20	1,717	1,842	22.17	1.07
March	69,279	3.93	2,724	3,004	23.06	1.10
April 1-20	82,825	3.69	3,057	3,352	24 71	1.09
Nov. 18-30	79,435	4.88	3,879	4,042	19.65	1.04
December	123,871	4.92	6,137	6,651	18.62	1.08
	430,956	4 41	19,005	20,530	20.99	1.08

Milk for Cheesemaking.

Month.	Lb Milk.	Average per cent. fat.	Lb. Fat.	Lb. Green Cheese.	Lb. Cheese per lb. of fat in milk.	Lb. Milk. to 1 lb. Cheese.
January	28,112	4.13	1,161	2,948	2.54	9.53
February	25,370	4.02	1,019	2,525	2.46	10.04
March	34,574	3.77	1,302	3,240	2 48	10.69
April 1-3	4 252	3 67	156	392	2.56	10 58
Dec. 2-31	20,836	4.45	928	2,270	2.45	9.18
	113,144	4.03	4,566	11,375	2.49	9.95

In the short courses the work was so arranged as to give the greatest possible amount of training and practice in the space of three weeks. A course of eighteen lectures was given, covering the subjects of dairy husbandry, breeding and feeding the dairy cow, the elaboration and composition of milk, the principles involved in the manufacture of cheese and butter, the conditions which influence the quality and yield of cheese and butter, and kindred topics. No certificates were given in the short courses.

The long course, January 16th to February 26th, was given for those men who desired a more advanced course of dairy instruction, and who were desirous of fitting themselves for responsible positions in their chosen line of work.

The practical work of the school is carried on in two departments, namely, butter making and cheese making. Students desiring instruction in both subjects

complete one before taking up the other. Dairy bacteriology and milk testing are taught in all courses.

The butter making department is equipped with all the leading styles of hand and power separators, milk pasteurizer, cream pasteurizer, cream vats, combined churns and workers, trunk churn, revolving table butter worker and other apparatus. The students in this department are divided into three sections; after the morning lecture from 9 to 10 o'clock, one section is assigned work in the separator room, one in butter making and the other in testing milk. In running the different separators students are required to make daily records of the capacity, speed, temperature, etc. Practical observations of the effects of variations in the conditions are frequently made so that the students learn the limitations under which the several separators employed will do good work. Cream is churned at different temperatures and degrees of ripeness, and the butter is worked and salted in various ways, so that the students may become thoroughly familiar with the process of making fine butter for the requirements of different markets as practised by the most skilful makers. The whole milk, skim-milk and buttermilk are tested daily in order to locate the losses in separating and churning.

The cheese-making department is equipped with all the apparatus necessary for making Canadian cheddar cheese, including six cheese vats, upright and gang presses, and the leading makes of curd mills. Students are drilled in the use of different rennet tests, Lloyd's test for acidity and the hot iron test. The preparation and use of "starters," handling over-ripe and gassy milk, the effect of varied quantities of rennet, the amount of acid at dipping, high piling, washing curds, and other matters of practical importance to cheese makers, are studied in detail. The fermentation test is in constant use; the students being trained in locating taints not easily detected in the ordinary examination of milk. The student in charge of a vat is expected to see that his cheese is neatly bandaged and properly pressed. Every step in the process of cheese making is explained in full and discussions on cheese making are held daily while the practical work is being carried on.

As bacteria play such an important role in all dairy operations, the subject of bacteriology is given special attention through lectures and demonstrations by Dr. Connell of the Medical College of Queen's University.

Additions are being made to the library from time to time, and it is now well stocked with the standard works on dairy husbandry and technique. The library is open for an hour each day for the exchange of books. The leading agricultural and dairy journals are kept on file.

Students desiring the same are given instructions in the management of boilers and engines, lining shafting, pipe fitting, etc.

In the testing room the various tests applied to milk are studied, and a thorough drilling in the use of the Babcock test and the lactometer is given. Students are taught how to detect the various adulterations of milk, both in regard to extent and kind. The number of factories that pay by test is increasing, and several students came to the school entirely for the purpose of qualifying themselves to pay by test in their factories.

It is necessary that a cheese maker should know how to test milk in order that his patrons will have confidence in his ability to protect their interests. In paying for the milk used in the school the composite test is used. The students are shown how to calculate the loss of butter-fat in skim milk, buttermilk, and whey, and are made acquainted with the details of the business management of creameries and cheese factories.

A number of prominent dairymen from a distance visited the school while classes were in session and addressed the students. The Director, Dr. Jas. Mills of Guelph, paid the school an official visit in January.

The students held several evening meetings, when papers were read followed by discussions; such meetings are a benefit in giving those who took part in them practice in public speaking.

A great many students continue to attend the school year after year, and it is this class that directly receive the greatest benefit from the school. These are also the men who are doing much to improve the quality of our cheese and butter, and are of the greatest help to the patrons of the cheese factories and creameries that employ them. To meet their needs the standard of instruction is being constantly raised, while at the same time the interests of the students who attend the school for the first time are in no wise neglected.

The school is now strongly entrenched in the regard of the dairymen of Eastern Ontario, and the outlook is that when the session of 1901-2 closes there will have been registered the largest attendance in the history of the institution.

(Signed) J. W. HART, Superinendent.

Kingston, March 28th, 1902.

WESTERN DAIRY SCHOOL, STRATHROY.

G. C. Creelman, Toronto....Director.
Archibald Smith .....Superintendent and Instructor in Cream Separators and Buttermaking.
Geo. E. Goodhand .....Instructor in Cheesemaking.
Frank Herns ..... " Milk-testing.
James Bristow .....Assistant Instructor in Cream Separators.
R. M. Smith..... ... " " Buttermaking and Machine Shop.
Miss Bella Millar .....Instructress in Home Dairy.
C. F. Neu, M.D..... .... Bacteriologist.
J. P. Whitehead, V.S.. ....Veterinary Science.

The Western Dairy School reopened on December 2nd, 1901, for a special creamery course of three weeks' duration. This course was intended especially for those who wished to take charge of winter creameries and who could not take the long course.

The attendance this year has been the largest in the history of the school. This was partly owing to the success of former students, who with one exception won the best prizes at the large exhibitions in Ontario last year. During the term 81 registered. Their experience ranged from none at all up to twenty-three years, the average experience of the whole class being over five years. The attendance by counties was as follows: Bruce, 3; Dufferin, 2; Durham, 2; Elgin, 1; Essex, 2; Grey, 1; Huron, 10; Kent, 1; Lambton, 1; Middlesex, 27; Norfolk, 1; Northumberland, 2; Oxford, 8; Peel, 1; Perth, 11; Simcoe, 2; Waterloo, 2; Wellington, 2; York, 1; and Chateauguay, Que., 1.

An important advantage which this school possesses is the large supply of milk, enabling the students to learn cheese and butter making as it is carried on under factory conditions. Besides, cream is supplied from two skimming stations, so that the students are taught how to manufacture butter on the cream-gathering system. This is undoubtedly a very important consideration, since nearly the entire supply of butter exported from western Ontario is made on this system.

Two new departments have been added to the school this year, a laboratory and a machine shop. The study of bacteriology as it affects dairying was taken up. The latest laboratory appliances were secured and the students taught how to propagate different varieties of bacteria from various sources and afterwards carefully examine the results under a powerful microscope. Thus they learned, practically, the importance of germ life in dairying and also how best to control it.

The machine shop was fitted up as inexpensively as possible to show the students how few tools are necessary to do the soldering, plumbing, pipe-fitting, etc., in a factory. They were taught also how to dissect, adjust and care for an engine, for which purpose a special engine was procured, so that they could do this work themselves instead of being merely told how to do it. This part of the course is exceedingly valuable, as it will save very much time and money in the operation of a factory, especially if there is no machine shop near.

Along with the training given in the use of the latest and best appliances in milk testing, cream separators and butter making, the students also received the benefit of many experiments in cheese and butter making. In cheese making experiments were carried on in the handling of all kinds of gassy and tainted milks and in cooking the curd and curing the cheese at different temperatures. The "Wisconsin Curd Test" was also tried and found to be a very useful method of determining the quality of each patron's milk and with what flavor, if any, it was affected. There were experiments in pasteurizing sweet and sour cream, and churning at different temperatures, and with different percentages of acid to determine the effect on the quality and quantity of butter.

The attendance of ladies in the Home Dairy Department confirmed its previous popularity and benefit in training how to make dairy butter better and more uniform and on more scientific principles.

For two weeks in February the management secured the services of an expert domestic science teacher, Mrs. E. M. Torrance, who demonstrated how to cook meats, vegetables and salads, and how to make jellies, sauces and many other wholesome, palatable and dainty dishes. The class was shown how to prepare foods to build up and maintain the body to the best advantage, and how to do it with the least waste and at a minimum cost. To show how very popular and how much appreciated these lectures and demonstrations were, it is only necessary to say that the average daily attendance was over two hundred, and that at some classes many had to be turned away as the large lecture room would not hold them.

A literary society, formed among the students in January, has helped them very much by training them to collect and express their thoughts clearly and intelligently while on their feet. One of the most beneficial introductions was the discussion of dairy topics given and answered by the students and then generally discussed. They were thus trained to tell others what they knew, and this will be very valuable to them in their intercourse with their patrons.

The conventions of farmers and dairymen, which are a special feature of this school, were more popular and largely attended than previously. The attendance was so large that it was considered advisable to have the gentlemen and ladies meet in different rooms. The ladies thus had the opportunity of hearing lectures on and discussing topics relating to their home life and work, and they thoroughly appreciated the privilege. The ablest and best speakers obtainable were secured to address the farmers on the latest and most scientific methods of dairying and farming. It is an indisputable fact that the farmers, the producers of the raw material, are the ones who must be reached and educated in order to produce the finest quality of butter and cheese. These meetings have been found to be the only practicable and the best means of thus reaching and educating them.

Good positions were secured for all the students and factories for those who were capable of operating them. Indeed the demand for good cheese and butter makers far exceeded the supply and many more could have been placed in good situations.

ARCHIBALD SMITH, Superintendent.

Strathroy, March, 1902.

PAN-AMERICAN EXHIBITION AT BUFFALO, 1901.

AWARDS TO ONTARIO IN CHEESE AND BUTTER.

Gold Medal.

Province of Ontario. The only gold medal awarded for Cheese, exhibit from July 10th to November 1st.

Silver Medal.

Dairymen's Association of Western Ontario for exhibits of Butter and Cheese.

Honorable Mention.

The following are the individual exhibits with scores, for which honorable mention diplomas were awarded :

Name of Exhibitor.	Address.	Exhibit and Score.
Jas. R. Burgess	Bluevale, Ont.	Export Cheese 97.25
Stewart R. Payne	Warsaw "	" 96.75
E. E. Kennedy	Welland "	" 97.50
Thos. McDonald	Morrisburg, Ont.	" 97.25
F. E. Kline	Lakefield "	" 98.75
J. T. Morrison	Woodstock "	" 98.75
Geo. A. Boyes	Putnam "	" 97.50
W. P. Stacey	Fullarton "	" 97.00
Miss Mary Morrison	Newry "	" 98.25
R. R. Cranston	Lawrence Sta. "	" 98.00
B. S. McConnell	Springhill "	" 96.25
John Connolly	Malcolm "	" 98.25
J. S. Isard	Paisley "	" 97.25
J. S. Isard.	Williscroft "	" 97.75
A. E. Millson	Lakelet "	" 96.50
Jos. Cramer	Glenvale "	" 97.00
W. F. Gerow.	Napanee "	" 98.25
J. W. Clarridge	Glen Huron "	" 98.00
Robt. Smith	Monkton "	" 98.50
Connolly Bros.	Thamesford "	" 98.25
J. D. Bird	Brigden "	" 97.75
Dairy Department, O.A.C	Guelph "	" 98.75
W. H. Vont	Jasper "	" 96.75
Frank A. White	Mitchelville "	" 97.25
W. R. Kaiser	Lansdowne "	" 97.00
J. A. McIntyre	Palmerston "	" 96.50
Alex. McGregor	Russell "	" 98.50
Jas. Craighead	Havelock "	" 96.25
John Francis	Courtland "	" 98.50
Frank Travis	Courtland "	" 98.00
E. G. Marshall	Guysboro "	" 97.75
N. S. McLauchlin	Henfryn "	" 97.00
W. A. Bothwell	Hickson "	" 94.50
J. S. John on	Banner "	" 98.50
D. M. Willson	Rock Spring "	" 97.75
Warren Feely	Cannamore "	" 98.00
I. M. Smith	Long Lake "	" 97.25
John E. Stanton	Cotswold "	" 97.50
Andrew Clancy	Rockwood "	" 98.75
S. P. Brown	Birnam "	" 98.50
G. E. Goodhand	Milverton "	" 97.25
M. Morrison	Harriston "	" 97.25
Thos. Grieve	Wyandotte "	" 96.50
E. N. Hart	Milverton "	" 98.25
J. H. Davidson	Hammond "	" 97.00
Fred Grothier	Escott "	" 98.50
B. Dinwoodie	Lyons "	" 98.75
Robt. Johnston	Bright "	" 98.00
J. E. H. Miller	Combermere "	" 96.75
A. T. Bell	Tavistock "	" 97.50

EXHIBITS—*Concluded.*

Name of Exhibitor.	Address.	Exhibit and Score.	
O. J. B. Yearsley	Little Britain	"	97.05
Alex. McKay	Brooksdale	"	98.25
Wm. Stubbs	Georgetown	"	95.25
T. B. Seller	Laurel	"	98.00
Geo. Travis	Tilsonburg	"	98 00
Harry Pannell	Canboro	"	96.25
W. M. Holmes	Shanly	"	94 25
McClure Cheese Co	Maynooth	"	98.00
Thos. E. Young	Watford	"	97.50
H. H. House	Walkers	"	96.75
Walter Hamilton	Listowel	"	98.00
D. C. Metcalfe	Glamis	"	96.50
Albert Herrington	Russell	"	96.75
C. A. Publow	Perth	"	97.75
C. V. DeLong	Little Current	"	96.25
Peter Callan	Drumbo	"	97.00
Wm. A. Brodie	Glanworth	"	96.50
Hugh E. Wilson	Keyser	"	98.75
W. C. A. McKay	Courtice	"	95 25
W. J. Douglas	Fort Stewart	"	98.00
Geo. R. Brooks	Douro	"	96.25
Robt. John Weir	Omemee	"	96.00
C. C. Travis	Aylmer	"	97.25
G. B. Brodie	Gladstone	"	95.25
Geo. Cleal	Selby	"	98.50
W. J. Caddey	Ingersoll	"	95.75
S. E. Morris	Prestonvale	"	95.75
J. A. Steiss	Heidelburg	Limburger Cheese	96.50
Henry Minor	Canboro'	Export Cheese	95.25
Robt. Cuddie	Woodstock	"	94.75
D. Sinclair	Arthur	"	97.00
Thos. F. Boyes	Lambeth	"	97.50
R. W. Thompson	Springbrook	"	97.25
D. A. Dempsey	Stratford	"	97.50
W. T. Hollis	Hay Bay	"	96.25
Benson Avery	Summerstown Sta	"	98.00
Jos. F. Ragsdale	Huntley, Ont.	"	98.00
Robt. Groat	Georgetown	"	97.00
J. E. Fester	Port Maitland	"	96 50
A. W. Darrock	Fordwich	"	97 00
E. M. Johnston	Innerkip	"	97.00
Wm. Freir	South Cayuga	"	94.25
Owen Priddle	Courtland	"	97.00
John H. Scott	Culloden	"	95 50
J. H. Williams	Lyons	"	96.50
Wm. Waddell	Kerwood	"	96 50
W. Affleck	Clayton	"	98.75
John Echlin	Carlton Place	"	98.50
Edward Bryce	Perth	"	98 75
L. H. Schneider	Monkton	"	97.50
P. McDonald	Lakeville, P. E. I	"	94.00
Jos. Burgess	Hazelbrook	"	96 75
R. Jenkins	Mount Albion	"	96.50
John Smith	Pownall	"	95.25
Chas. Myers	Lakeverd	"	97.50
H. H. Curtis	Hawkesbury, Ont.	"	98 25
J. G. Corless	Burgessville	"	98 00
James Whitton	Wellman's Corners, Ont.	"	95.50
Jas. Ireland & Son	Beachville	Creamery Butter	95.25
Aaron Wenger	Ayton	"	95 75
Wm. Parkinson	Jarvis	"	95.00
Dairy Department O.A.C.	Guelph	"	96.00
Jas. Struthers	Owen Sound	"	96 25
Vinemount Creamery Co	Vinemount	"	94.50
W. H. Stewart	Frontier, Que.	"	97 00
John McQuaker	Owen Sound, Ont	"	97.50
J. C. Bell	Winchelsea	"	94.75
W. H. Brubacher	Fergus	"	96.75
S. R. Brill	Teeswater	"	97.25
Jos. Babb	Gilford	"	95.75
A. G. Calder	Dunkeld	"	95.75
C. E. Lister	Chatnam	"	94.25
Delly Bennett	Russellton	"	96.75

ANNUAL REPORTS

OF THE

LIVE STOCK ASSOCIATIONS

OF THE

PROVINCE OF ONTARIO

1901.

DOMINION CATTLE BREEDERS' ASSOCIATION.

DOMINION SHEEP BREEDERS' ASSOCIATION.

DOMINION SWINE BREEDERS' ASSOCIATION.

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

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ANNUAL REPORTS

OF THE

LIVE STOCK BREEDERS' ASSOCIATIONS,

1901.

To the Honorable the Minister of Agriculture:

I have the honor to submit herewith the Annual Reports of the Dominion Cattle Breeders' Association, the Dominion Sheep Breeders' Association and the Dominion Swine Breeders' Association. Your obedient servant,

A. P. WESTERVELT, Secretary.

DOMINION CATTLE SHEEP AND SWINE BREEDERS' ASSOCIATION

REPORT OF THE SECRETARY.

The Cattle Sheep and Swine Breeders' Associations were organized to assist in promoting live stock trade, to assist in giving such instruction that a better class of stock may be produced, and to generally look after the interests of those engaged in the live stock industry. The work of 1901 has been done with these objects specially in view.

The Winter Fair.

At the Winter Fair the educational features are with each year's experience becoming more practical. The facilities so far as could be foreseen are very well adapted for the purpose of illustration lectures. The Minister of Agriculture for Ontario, recognizing the importance of the work in connection with the Fair, has been most liberal in supply the necessary funds for equipment and for carrying it on. The Fair of 1901, with respect to numbers, far surpassed anything held previously. The large attendance was not so striking a feature as the apparent anxiety to hear the lectures and learn something which might be put in practice in future work. The number of admissions was in the neighborhood of 20,000, almost double that of 1900, which year was more than double that of any year previous. This is encouraging. It should urge us on to still greater efforts. It is not the largest show on earth, but I believe we can claim for it the advantage of being the one which gives the most valuable instruction along live stock lines. Its one object is to teach.

What is an ideal animal? The proper selection for breeding, how to finish, and how and when to market. All lectures are illustrated. There is no way in which so clear and lasting an impression can be received as through the eye. The judges before starting on their work gave a description of the animal they considered the pro-

per type. After each award they gave the reason why they considered the first prize animal came closer to that type than the one winning second prize, and so on through the different winners. Those who watched the judging should by giving close attention have received some useful and practical lessons.

The entries were larger than ever before, and this, together with the increased attendance, made it absolutely necessary that more accommodation be provided. The Winter Fair Board this year will have to undertake the work of providing sufficient space for all possible needs of the Fair.

With regard to the hotel accommodation it might be said that last year arrangements were made with private families in Guelph to accommodate about five hundred people, and a man for billeting was placed in charge of this work, and was paid by the city. Only about seventy people went to private houses. It would seem that it will be necessary to find some other solution to the difficulty of the accommodation.

Interprovincial Trade.

Since the appointment of the Live Stock Commissioner great attention has been given by him to the live stock trade between the Provinces. The success of his efforts in this respect have been most marked. In 1899 the amount of stock purchased through the Live Stock Associations amounted to $2,254. In 1900 the trade increased to $4,958, while since January, 1901, the value of stock bought and shipped both east and west through the Live Stock Associations amounted to over $50,000. No effort should be spared during 1902 to increase this trade, and your directors should be instructed to use every means possible to further the efforts of the Live Stock Commissioner in this respect.

During the past year there have been forty-five cars of stock shipped to the west through the Live Stock Associations. As provided for at the last annual meeting a man was permanently employed to go with the cars, but it was afterwards necessary to engage further help in order to have the stock shipped as required. Each Association paid $50 towards paying for the services of the man permanently engaged, and this should again be done.

Stock for the Northwest Territories.

Arrangements have been made with the Department of Agriculture for the Territories that a limited number of bulls and females for bona fide settlers can be delivered from Ontario to any point in the Territories for $5 and $7.50 per head respectively It has also been arranged that when a carload is offered for points on the main line in the west so that reshipping will not be necessary, they can be shipped immediately without waiting until May or June, as has heretofore been the case.

Auction Sales.

The auction sales of pure bred stock are advertised for February 12th at Ottawa, and February 26th at Guelph. Advertising is being done as extensively as the funds will allow, and an effort is being made to have a catalogue in the hands of probable buyers in good time in the eastern and western Provinces and in the United States. A grant of $650 is again given by the Live Stock Commissioner for the purpose.

For the work of education as to proper fitting, nothing could do more good than the sale of last year. It demonstrated most conclusively to large numbers the actual difference in the money value of an animal properly fitted for sale and one in not so good condition. The sales last year also demonstrated that good stock in good condition would bring its full value at these sales and the result will be that a much better class of stock and in better condition will be offered at the coming sales than

at those of 1901. This is one of the new features of the work of the Associations, and each member should take a special interest in it and do all the advertising possible in the local districts. Nothing has been accepted for the coming sales but good individuals, and any person wanting pure bred stock will not have a better opportunity of purchasing than at these sales.

The results of the sale at Guelph and Ottawa were as follows :

Cattle.	Guelph.						Ottawa.					
	Bulls.			Females.			Bulls.			Females.		
	No.	Amount	Av.	No.	Amount	Av.	No.	Amount	Av.	No.	Amount	Av.
		$	$		$	$		$	$		$	$
Shorthorns	98	7,667	78.23	24	2,216	92.33	20	2,715	135.75	10	1,400	140 00
Herefords	3	300	100.00	2	102	51.00	....	.....	.....	1	100	100 00
Galloways	1	72	72.00	....	.....	....	....	.....	.....	....	.....	... ..
Polled Angus.	4	230	57.50	1	73	73.00	....	.....	.	....	.....	...
Ayrshires	2	86	43.00	8	417	52.13	27	1,063	39.37	5	435	87.00
Guernseys	....	.....	.....	....	.....	.....	1	35	35.30	....	.....	.....
Holsteins	....	.....	.....	4	182	45.63	3	109	36.33	....	.....	.....
Swine.		Boars.						Boars.				
Berkshires	2	10	5.00	....	.....	... ..	3	39	13.00	1	24	24.00
Tamworths	3	27	9.00	....	.....	.....	2	20	10.00	4	55	13.75
Yorkshires	9	268	29.78	4	37	9.25	6	68	11.33	11	212	19.27

The total amount of the sales aggregated $17,962—at Guelph, $11,687, and at Ottawa, $6,275.

Prize List for Live Stock at Fall Fairs.

Methods of conducting agricultural exhibitions have been under discussion recently. Representing the live stock industry, it will be advisable for the Live Stock Associations to take this matter up and make suggestions so far as the live stock department is concerned. First it is necessary that proper rules and regulations govern, and that the prize list offer prizes for the right sort of animals. Second, it is necessary that an entirely competent judge be appointed to place the awards. Last year at a large number of exhibitions in Eastern Ontario live stock judges were nominated by the Live Stock Commissioner to judge the live stock. These gentlemen were expected to place the awards and give reasons for each decision. This is very satisfactory to exhibitors and to those interested, everyone receiving instruction according to the ideals of the judge.

The annual meeting of the Canadian Association of Fairs will be held on the 19th and 20th of February. The Live Stock Associations should prepare a model prize list for live stock and rules governing same, and have this submitted to the Fairs Association with an earnest recommendation that it be adopted for use at all district and township fairs. A recommendation should also be made that only expert judges, nominated by the Live Stock Associations, should be appointed to act as judges on live stock at fall fairs. These recommendations should be strongly urged.

A committee appointed to prepare a model prize list by the Sheep Breeders' Association met in the Live Stock Tent at the Toronto Industrial Exhibition. The following classification was adopted :

1—Ram, two shears and over.

2—Shearling ram.

3—Ram lamb.

4—Shearling ewes.

5—Ewe lamb.

6—Pen—Ram lamb and three ewe lambs bred by exhibitor.

7—Pen—Ram, any age; 2 shearling ewes, 2 ewe lambs.

8—Pen—Canadian bred, not shown in section 7; ram, any age; 2 shearling ewes, 2 ewe lambs, bred and owned by exhibitor.

Pan-American Exposition.

A full report of Ontario prize winners will be published by the Department of Agriculture. The expense of inspecting exhibits offered for exhibition were borne by the Ontario Department of Agriculture, and all Ontario entries were sent to Buffalo through the Secretary of the Live Stock Associations. Freight and shipping arrangements for all departments of live stock were also made by the Secretary, the expense of gathering together into carloads being borne by the Provincial Department. All other expenses incurred were borne by the Dominion Department of Agriculture.

World's Fair at St. Louis.

At the World's Fair at St. Louis in 1903 the management promise a very large prize list in the live stock department. It would be well to consider the approximate number of exhibitors there might be from Ontario, and what would be the benefit of an exhibit to the Province and to Ontario breeders.

Swine Record.

Following is the number of each breed of swine recorded during 1901:

Berkshires	1,280
Yorkshires	2,420
Chester Whites	432
Poland Chinas	97
Tamworths	502
Duroc-Jerseys	39
Suffolks	3
Essex	8
Total	4,781

The certificates are published in volume No. 12, parts I, II and III, which have already been issued. Part IV will be ready for distribution early in February. This volume contains copies of all certificates issued during 1901. The members appear to be very well pleased with the method of publishing.

Grant from Swine Breeders' Association to Western Exhibitions.

For several years a grant of $85 has been given to the Winnipeg Fair, and $40 to Brandon. During the past two years a large number of pigs have been sold to breeders in British Columbia. Application for a grant to the Provincial Exhibition at New Westminster has been received. I believe it would create a good feeling and be beneficial to the trade with this Province if a small grant were given to this exhibition.

Conclusion

In concluding I give a few figures which show to some extent the growth of the Associations. In ten years the attendance at the Winter Fair has grown from about 500 to 20,000 and prizes offered from $325 to $6,863. The membership of the Live Stock Associations in seven years has grown from 258 to 2,204. During the past year $97,000 has passed through the hands of the Live Stock Associations.

A. P. Westervelt, Secretary.

DOMINION CATTLE BREEDERS' ASSOCIATION.

ANNUAL MEETING.

The annual meeting of the Dominion Cattle Breeders' Association was held in the Palmer House, Toronto, January 22nd, 1902, at 2 p.m. In the absence of the President Mr. A. W. Smith was elected Chairman.

The minutes of the last annual meeting were taken as read.

That the report of the Secretary was recieved and adopted.

The financial statement was read by the Secretary-Treasurer and adopted.

Model Prize List for Fall Fairs.

Mr. A. W. Smith stated that at the last annual meeting of the Sheep Breeders' Association a committee was appointed to take up the matter of a model prize list, and suggested that it would be advisable to discuss the matter at this annual meeting or appoint a committee to look into the matter and report. After a short discussion the following resolution was passed:

"That David McCrae, A. W. Smith, Captain Robson, F. W. Hodson, G. W. Clemons, J. G. Clark, G. C. Creelman and Major McGillivray be a committee to consider the prize lists and rules and regulations governing the different exhibitions, with power to act."

On motion it was resolved: "That F. W. Hodson, Dominion Live Stock Commissioner, and G. C. Creelman, Superintendent of Farmers' Institutes, be members of all committees of the Dominion Cattle Breeders' Association."

Judges Nominated for Provincial Winter Fair—Robert Miller, Stouffville; W. B. Watt, Salem; John Gibson, Denfield; Thomas Crawford, Toronto; Joseph Gould, Toronto; W. D. Flatt, Hamilton; A. W. Smith, Maple Lodge; Alderman Dunn, Toronto.

Sale Committee.

That the sale committee be composed of the President, Vice-President, Secretary and Mr. Wade, with power to act as they deem wise and prudent.

On motion it was resolved: That J. C. Smith and J. G. Clarke be the Eastern Sale Committee to act in conjunction with the Executive of the Sale Committee.

New Business.

In referring to the clause in the Secretary's report regarding the World's Fair at St. Louis, the Chairman said: "I think it advisable, if we can come at it even approximately, to get an idea of the number of exhibitors that would be going to St. Louis in 1903, that is, I presume, the cattle exhibitors in this meeting. It would be a great assistance to those who have charge of the matter or would be likely to give assistance in that case."

Moved by Major McGillivray, seconded by Jas. Bowman, "That this Association requests the Dominion Government to make a liberal grant to this exhibition in the interests of Canadian exhibitors, and a committee be appointed to await upon the Minister and Government, and that action be taken at once, so that this session of Parliament may deal with it, and so that Canadian exhibitors may know their decision in order to save their best animals for that Exhibition, and that our present Chairman nominate the committee." Carried.

Mr. McCrae said he knew of two lots of Galloways that would be going, Mr. Jas. Bowman knew of one lot of Polled Angus, and Major McGillivray knew of one lot of Dorset Horned Sheep.

OFFICERS FOR 1902.

President ..... ARTHUR JOHNSTON, Greenwood.

Vice-President ..... A. W. SMITH, Maple Lodge.

Secretary-Treasurer ..... A. P. WESTERVELT, Toronto.

Vice-Presidents (representing the different Provinces :

Ontario ..... H. WADE, Toronto.
Manitoba ..... HON. THOS. GREENWAY, Crystal City, Man.
Northwest Territories ..... C. W. PETERSON, Regina, N.W.T.
Quebec ..... H. D. SMITH, Compton, Que.
Nova Scotia ..... E. B. ELDERKIN, Amherst, N.S.
New Brunswick ..... T. A. PETERS, Fredericton, N.B.
British Columbia ..... G. H. HADWEN, Duncans, B.C.
Prince Edward Island ..... JUDGE HAZZARD, Charlottetown, P.E.I.
Newfoundland ..... HON. THOS. C. DUDER, St. John's, N'f'd.

Directors :

Shorthorns ..... T. E. ROBSON, Ilderton, and JOHN ISAAC, Markham.
Herefords ..... W. K. GOODING and A. STONE, Guelph.
Galloways ..... R. SHAW, Brantford, and D. MCCRAE, Guelph.
Ayrshires ..... W. W. BALLANTYNE, Stratford, and H. WADE, Toronto.
Holstein-Friesian ..... A. GIFFORD, Meaford, and G. W. CLEMONS, St. George.
Polled Angus ..... JAMES BOWMAN, Guelph.
Jerseys ..... T. PORTER, Mount Dennis, and ROBERT MCCULLOCH, Snelgrove.
Ontario Agricultural College ..... G. E. DAY, Guelph.

General Director ..... J. M. GARDHOUSE, Highfield.

Auditor ..... J. M. DUFF, Guelph.

Delegates to Fair Boards :

Toronto ..... J. A. MCGILLIVRAY, Uxbridge, and A. P. WESTERVELT, Toronto.
Ottawa ..... J. G. CLARK, Ottawa, and F. W. HODSON, Ottawa.
London ..... R. GIBSON, Delaware, and T. E. ROBSON, Ilderton.
Brantford ..... G. W. CLEMONS, St. George, and J. R. ALEXANDER, Brantford.
Provincial Winter Fair ..... G. W. CLEMONS, St. George, J. T. GIBSON, Denfield, and JOHN BRIGHT, Myrtle.

FINANCIAL STATEMENT FOR THE YEAR ENDING DECEMBER 31st, 1901.

Receipts.

Cash on hand from previous year as per last report	$ 77 68
Members' fees	741 50
Legislative grant	2,000 00
Total	$2,819 18

Expenditure.

Grant to Provincial Winter Fair	1,932 25
Officers' salaries	150 00
Directors' fees and expenses	63 77
Postage and stationery	78 87
Periodicals for members	149 44
Cost of reporting	2 00
Miscellaneous:	
Wages for man in charge of stock cars	50 00
Typewriting and office work	332 72
Auditor, 1900	5 00
Express, duty, etc	7 00
Telegraph, telephone, etc	22 79
Exchange, $1.35 ; cleaning office, $2.00	3 35
Balance stock car account, 1900	9 86
	$2,807 05
Balance on hand	12 13

Examined and found correct, this 23rd day of January, 1902.

ARTHUR JOHNSTON,
President.
A. P. WESTERVELT,
Secretary.

J. M. DUFF, Auditor.

MEMBERS OF THE DOMINION CATTLE BREEDERS' ASSOCIATION, 1901 AND 1902.

Name and Address.	Breed.
Acres, J. G., Vernon	Holsteins.
Adams, Edward, Toronto	"
Aitchison, N., Guelph	
Aitchison, S., Guelph	
Airth, H. J., Renfrew	Holsteins.
Alton & Son, Thomas, Appleby	Shorthorns.
Anderson, Thomas, Lyn	Holsteins.
Arnold, J. B., Easton's Corners	"
Armstrong, Wm., Locust Hill	"
Armstrong, Wm., Tillsonburg	"
Baird, Charles, Motherwell	"
Bald, Adam M., Sebringville	"
Baxter, A. B., Hamilton	Shorthorns.
Beck, S. R., South Cayuga	Holsteins.
Bell, James R., Athelstan, Que.	"
Beemer, John, St. George	"
Bollert, H., Cassel	"
Bonsall, H., Chemainus, B C	"
Bonnycastle, F., Campbellford	Shorthorns.
Bowman, James, Guelph	Polled Angus.
Boyd, Mossom & Co., Bobcaygeon	Herefords.
Brown, John, Galt	"
Brown, F. I., Kelso, Que	Holsteins.
Brown, D. H., Kelso, Que	"
Brown, W. W., Lyn	"
Brent, Geo., Warford	Herefords.
Burt, J. W., Coningsby	Polled Angus.
Carlaw, Thomas B., Warkworth	Holsteins.
Cameron, Andrew, Westwood	"
Came, F. E., Montreal Que	"
Caskey, J. A., Madoc	"
Cameron, J. W., Perth	"
Chapman, J. G. & Son, St. Thomas	Shorthorns.
Chapman, James, Clandeboye	
Charlton, Thomas W., St. George	Holsteins.
Clarkson, John, Summerville	"
Clemons, G. W., St. George	
Cohoe, J. W., New Durham	Holsteins.
Connor, John, Gananoque Jct	"
Craik, Dr. Robert, Montreal, Que	"
Curtis, C. H., Newmarket	"
Davidson, Thomas, Spring Valley	"
Derbyshire, J. B., Wheatley	
Dixon, W. L., Dromore	Ayrshires.
Dickieson, John, Eramosa	Devons.
Douglas, James, Caledonia	"
Dore, W. O., Trout Creek	Holsteins.
Dougherty, James W., New Durham	"
Duncan, W. A., Emery	"
Dundon, John, Hedley Lodge, Que.	"
Dyment, N., Clappison	Ayrshires.
Ellis, W. G., Bedford Park	Holsteins.
Elderkin, E. B., Amherst, N.S	Jerseys.

LIST OF MEMBERS.—*Continued.*

Name and Address.	Breed.
Ferland, Jos. B., Three Rivers Que.	Holstein.
Fletcher, Joseph, Oxford Mills	"
Fleming, D., Clanbrassil	
Foxton, Richard, New Dublin	Holsteins.
Foster, A. D., Halloway	"
Ford, Robert, Kemble	Shorthorn.
Fried, John, Roseville	"
Gardhouse, J. M., Highfield	Shorthorns.
George, H. E., Crampton	
Gibb, James, Brooksdale	Shorthorns.
Gies, C. R., Heidelberg	
Gifford, A., Meaford	Holsteins.
Gilroy, C. J., Glen Buell	"
Gilroy, G. A., Glen Buell	"
Glass, Geo. O, Sweetsburg, Que	"
Glennie, James, Longbird, Man	
Granger, M. & Son, Londesboro	Shorthorn.
Green, James, Fergus	
Hall, Walter, Washington	Polled Angus.
Hallman, A. C., New Dundee	Holsteins.
Hales, Alf, Guelph	Durhams.
Harper, Samuel, Cobourg	Devons.
Hartley, Thomas, Norwich	Holsteins.
Hartley, Henry, New Durham	
Hawse, Wm., Athens	"
Hill, G. W., Cumnock	Shorthorns.
Honey, R., Brickley	
Hood, G B., Guelph	Grades.
Hoover, A., jr., Oshawa	Holsteins.
Hubbs, L. P., Hillier	
Jones, M. J., Villa Nova	"
Kaufman, A. E., Washington	Polled Angus.
Kennedy, A., Ayr	Holsteins.
Kincaid, C. A., Lyn	"
Lee, E., Stoney Creek	Jerseys.
Lee, J. W., Simcoe	Holsteins.
Lint, J. W., Attercliffe Station	"
Lloyd-Jones & Son, Burford	Guernseys.
Logan, H. L., Amherst, N.S	Holsteins.
Logan, S. A., Amherst, N.S	"
Love, A., Eagle	Shorthorns.
Macklin, S., Wicklow	
Mallory, B., Frankford	Holsteins.
Milne, D., Ethel	Shorthorns.
Minnesota University, St. Anthony Park, Minne	
Moorhead, J. G., Ventnor	Holsteins.
Mooney, J. W., Inverness, Que.	Shorthorns.
McCusig, M., Vankleek Hill	
McCrae, D., Guelph	Galloways.
McDiarmid, D. R., Ridgetown	Shorthorns.
McDonald, D. R., Williamstown	Shorthorns.
McDonald, Peter A., Ormond	Holsteins.
McDougal, A, Guelph	Polled Angus.
McClure, W., Norval	Holsteins.
McEwen, R., Byron	Shorthorns.
McFarlane, J., Clinton	Polled Angus.
McGregor, J., Constance	Holstein.
McMillan, T., Seaforth	Shorthorns.
McNeil, C. A., Gananoque	Holsteins.
Myles, James E., Heathcote	Shorthorns.
Newlands, W., Ehurne, B.C	Holsteins.
North, Geo., Marden	"
Oughton, J., Middlechurch, Man	"
O'Brien, John, London West	Jerseys.
O'Mahony, Daniel, Renton	Holsteins.
Pannabecker, E., Hespeler	"
Page, H. F., Mission City, B.C.	Holsteins.
Palmer, B. J., New Durham	"
Park, Henry, Norwich	"
Parkinson, G. W., Eramosa	Shorthorn Grades.
Patten, J. H., Paris	Holsteins.
Patterson, W., Wawanesa, Man	"
Peters, O. J., Moncton, N.B	"
Phillips, F. W., Oakville	Polled Angus.
Pickering, J., Frelighsburg, Que.	Holsteins.
Perie, F., Putman	"
Potter, A. B., Montgomery, Assa	"
Reece, J., Chilliwack, B.C	"
Reesor, F. E. N., Locust Hill	"
Rettie, J., Norwich	"
Rice, A., Currie's	"
Rice, G., Currie's	"
Rife, D., Hespeler	"
Richardson, A., Peepabun	Shorthorns.
Riahardson, J. A., South March	Holsteins.
Richardson, M., Caledonia	Holsteins and Shorthorn.
Robertson, J. W., Vankleek Hill	"
Robinson, R. J., Ailsa Craig	
Rosebrugh, J., St. George	"
Rudd, W. J., Eden Mills	Devons.
Sangster, M., Ormstown, Que	Holstein.
Scatcherd, E, Wyton	"
Schell, W. S., Woodstock	"
Scott, F. W., Highgate	Shorthorn.
Shaw, A. M. & R., Brantford	Galloway.
Sharp, J., Rockside	Polled Angus.
Sheridan, J. B., Slate River Valley	Holsteins.
Shunk, W., Sherwood	"
Shunk, S., Edgley	"
Sibbald, J., Annar	Galloway
Smith, A., Trowbridge	Shorthorns.
Smith, A. C., Paris	
Smith, A. W., Maple Lodge	"
Smith, J. C., Hintonburg	
Smith, C. H., Plum Hollow	Holsteins.
Smith, S. E., Dundas	"
Sherwood, T., Fergus	
Stevenson, R. S., Ancaster	"
Stewart, J. W., Lyn	"
Stone, A., Guelph	Herefords.
Stone, F. W., Stock Co., Guelph	"
Simmons, W. H., New Durham	Holsteins.
Smith, F. W., Scotland	"
Steves, J. M., Steveston, B.C	"
Sturgis, D. E., Tillsonburg	"
Suhring, W., Sebringville	"
Sweet, O., North Sutton, Que.	"
Taylor, F. W., Wellman's Corners	Ayrshires.
Telfer, Thos., Ingersoll	Holsteins.
Templer, W., Jerseyville	Shorthorns.
Walker, G., Ilderton	Shorthorns.
Walker, R. W., Utica	Holsteins.
Watson, G., Inverhaugh	Shorthorn Grades.
Watt, J. & W. B, Salem	Holsteins.
Welsh, H., Weston	"
Wolfe, M., Hespeler	
Woolley, A., Springfield	"
Wyckoff, I. G., Tyrrell	"
Wylie, J. H., Almonte	"
Young, S., Guelph	Polled Angus and Shorthorns

Members of the Shorthorn and Ayrshire Breeders' Associations are also members of the Dominion Cattle Breeders' Association.

DOMINION SHEEP BREEDERS' ASSOCIATION.

ANNUAL MEETING.

The annual meeting of the Dominion Sheep Breeders' Association was held in the Palmer House, Toronto, January 24th, 1902, at 10 a.m., the President Mr. A. W. Smith in the chair.

PRESIDENT'S ADDRESS.

I have pleasure this year again in congratulating the sheep breeders of the Dominion upon a successful year, and more particularly those who produce high-class breeding stock. It is true the price of mutton has not been so high as last year, yet there has been a demand for all that has been produced, and the fact that feed is scarce in the west, and consequently very high, has had the effect of forcing great numbers of unfinished sheep and lambs on the market, with the result of bringing down the market price, and this was natural, for generally the quality was not up to the mark, whereas not for years have better prices been paid for choicely fed and ripened wethers in the large markets. This is a healthy state, because we can see a good reason for dullness, and we cannot but consider the business prosperous.

But, on the other hand, the demand for and the prices paid for choice breeding stock, which we are so favorably situated to produce, has been better than past years. This is encouraging, for the enthusiasm, and I may say inspiration, of our breeders has led them to make commendable efforts to make the best of their special natural advantages. I repeat, there is no country or climate under the sun so well calculated and conditioned to produce such healthy and well developed a type of mutton breeds of sheep as this Canada of ours, and so long as our breeders pursue the calling with the zeal and enthusiasm they now evince, there will be no lack of profitable business.

Then, if we consider the grand exhibits made at all our larger shows, and many not so pretentious, we have reason to feel proud of our breeders who can make such a display of their skill not only in producing, but in maturing to a perfect ripeness so many specimens of the different breeds, and that, after supplying show flocks and filling up orders for our less fortunately situated neighbors across the line.

The past year has been one of very great success to our breeders. When they have taken their flocks out of our own country to place them in competition in the show ring with those of the United States, the result was very much to our credit, since with a smaller percentage of entries we have carried away a very large percentage of the premiums when we competed at the Pan-American, Buffalo, the International, Chicago, and other large shows, again proving that we have the animals, the environment and the breeders and shepherds to produce the sheep.

I believe also that beginnings have been made that will lead to events of great benefit to the sheep breeders of the Dominion. I refer to auction sales, such as are conducted with profit and convenience to the breeders of Great Britain. In October last a sale of sheep was held in Chicago, to which several others in Canada as well as myself contributed from our flocks, and although the prices were low, I believe that sale to be the beginning of what will be a profitable opening for the disposal of our surplus stock, and as will be announced later, arrangements have been begun for the holding of an annual sale of sheep under the same management as the cattle sales, and which will, I believe, be profitable and advantageous to our breeders.

And now, gentlemen, I want to thank you for the kindness and courtesy you have shown me while I have had the privilege of acting as President of our Association, and while I make way for other and perhaps better men, I can assure you I shall always find pleasure in working for the best interests of the Dominion Sheep Breeders' Association.

The minutes of the last meeting were taken as read.

The Secretary-Treasurer read his annual report, which was adopted with the amendments as given below.

Model Prize List for Fall Fairs.

A lengthy discussion took place as to the advisability of having a class for two-year-old ewes in the prize lists of the different fairs, after which the following resolutions were passed :

"That a section for two-year-old ewes be added to the list as given in the Secretary's report."

"That we recommend that a pen 'ram, lamb and three ewe lambs,' bred by exhibitor, be added to the prize list, as it is now printed in the report of the Secretary."

"That in sections 7 and 8 pen consist of 'ram, any age, two ewes, one 'year old and under three years, and two ewe lambs."

Following will then be classification :

1—Ram, two shears and over.

2—Shearling ram.

3—Ram lamb.

4—Ewe, two shears and under three.

5—Shearling ewe.

6—Ewe lamb.

7—Pen, ram lamb, 3 ewe lambs, bred by exhibitors.

8—Pen, ram, any age, 2 ewes, one year old and under three years, and two ewe lambs.

9—Pen, Canadian bred, not shown in section 8, ram any age, two ewes, one year old and under three years, and two ewe lambs bred and owned by exhibitor.

"That the Secretary be instructed to forward a copy of the classification in report, with amendments as adopted, to the secretaries of the Toronto, London, and Ottawa exhibitions."

"That the chairman, Major McGillivray and John Jackson, be a committee to meet the various other committees in Toronto on February 18th for the purpose of drawing up model prize lists, and that they have power to add to their numbers."

Sale Committee

"That the President, Vice-President and Secretary be a committee to look into the matter of sales with power to act and add to their number."

The appointment of judges for the Winter Fair was left in the hands of the Winter Fair Board.

Interprovincial Trade.

Mr. F. W. Hodson, Live Stock Commissioner, stated there was a great demand for our produce in the west, and thought it was quite necessary for one man to devote a good deal of his time to taking orders and sending them down to Ontario breeders to fill. They were greatly in need of good pure bred sires out there, and did not know just where to place their hands on them, whereas if a reliable man went out and took orders it would greatly increase business in Ontario.

On motion it was resolved, "That this Association instruct our Executive to take action in the matter of looking after our Interprovincial trade, and send a man out there, and take such steps as they think desirable, and that they have power to act in the matter."

New Business.

A motion was carried "That this Association recommend to the Winter Fair Board the advisability of allowing the grade classes to be shown by the owner, provided that they have been in their possession three months before the show."

On motion it was resolved, that this Association recommend the Winter Fair Board not to enforce that part of the rule regarding pure bred sheep being bred by exhibitor until after the next Winter Fair.

EXPERT JUDGES.

The following expert judges were then nominated :

COTSWOLDS : John Rawlings, Ravenswood ; William Thompson, Uxbridge ; Val. Ficht, Oriel; Jas. Hume, Arkell; W. G. Laidlaw, Wilton Grove; R. P. Snell, Snelgrove; S. J. Lyons, Norval; Jas. Russell, Richmond Hill; J. C. Snell, London; F. Bonnycastle, Campbellford; John Park, Burgessville; J. Hardy Shore, Glanworth; A. J. Watson, Castlederg; Prof. G. E. Day, Guelph; John V. Snell, Snelgrove. Judges nominated—Toronto : Robert Miller, Stouffville ; Jas. Hume, Arkell. London : Val. Ficht. Oriel ; John V. Snell, Snelgrove. Ottawa : Val. Ficht. Oriel ; W. Thompson, Uxbridge. Chicago: Prof. Curtiss, Ames, Ia.; Prof. Day, Guelph; R. P. Snell, Snelgrove.

LEICESTERS: R. J. Garbutt, Belleville; Jas. Fennell, Bradford; H. B. Jeffs, Bond Head ; A. E. Archer, Warwick ; Geo. Whitelaw, Guelph ; Hardy Shore, Glanworth; Abraham Easton, Appleby; E. Wood, Appleby; Wm. Parkinson, Eramosa; E. Parkinson, Eramosa; John Orr, Galt; Wm. Watt, Salem; Wm. McIntosh, Burgoyne; Thomas Currelly, Fullarton; R. Eastwood, Mimico; John Kelly, Shakespeare; And. Thompson, Fergus; J. K. Campbell, Palmerston; J. C. Snell, London; G. B. Armstrong, Teeswater; John Gibson, Denfield; C. E. Wood, Freeman; Jos. Gaunt, St. Helens; J. M. Gardhouse, Highfield; And. Whitelaw, Guelph; Wm. Whitelaw, Guelph; R. C. Martin, Marysville ; Alexander Smith, Maple Lodge ; Walter Nichol, Plattsville; H. G. Arnold, Maidstone; Prof. Craig, Ames, Ia., U.S.; John Marshall, Cass City, Mich., U.S.; J. W. Murphy, Cass City, Mich., U.S.; Prof. Curtiss, Ames, Ia., U.S.; D. C. Graham, Cameron, Ill., U.S.; Geo. Penhale, Exeter; Jas. Snell, Clinton ; Prof. Day, Guelph ; M. Kennedy, Northwood ; D. Lillico, Ayr. Judges nominated—Toronto : Jas. Fennell, Bradford ; Jas. Douglass, ———, reserve. London: H. B. Jeffs, Bond Head ; John Orr, Galt, reserve. Ottawa : John Orr, Galt. Brantford: W. Whitelaw, Guelph.

DORSETS. John Kelly, Shakespeare; Robert Miller, Stouffville; J. M. Gardhouse, Highfield; John Campbell, Fairview; J. G. Hanmer, Mount Vernon; Prof. Curtiss, Ames, Ia.; Thos. W. Hector, Springfield-on-the-Credit; G. P. Everett, Mt. Vernon; John A. McGillivray, Uxbridge; H. N. Gibson, Delaware; E. O. Denton, Somerset, N.Y.; G. McKerrow, Sussex, Wis.; John Hunter, Wyoming; Herbert Hanmer, Burford; A. Danks, Allamuchy, N.J.; John Jackson, Abingdon; Fred. Silversides, Uxbridge; R. H. Harding, Thorndale. Judges nominated—Toronto: Thos. W. Hector, G. P. Everett, reserve. London: J. G. Hanmer, Mt. Vernon; reserve, John Kelly, Shakespeare.

SOUTHDOWNS. John Jackson, Abingdon; Mr. Martin, Binbrook; W. H. Beattie, Wilton Grove ; W. N. Gibson, Beaconsfield; Richard Gibson, Delaware; T. C. Douglas, Galt; A. Simenton, Blackheath; H. B. Jeffs, Bond Head; John Miller, Markham; Henry Arkell, Teeswater; Wm. Telfer, Paris; J. G. Hanmer, Mount Vernon; H. B. Jeffs, Bond Head; Jas. Smith, Mount Vernon; Jas. Scott, Aberfoyle; Geo. McKerrow, Sussex, Wis.; Prof. Curtiss, Ames, Ia.; Prof. J. A. Craig, Ames, Ia.; J. C. Duncan, Lewiston, N.Y.

OXFORDS. Smith Evans, Gourock; Jas. Tolton, Walkerton; R. J. Hine, Dutton; Kenneth Finlayson, Compbellton; Henry Arkell, Arkell; William Dickson, Mildmay; Peter Arkell, Teeswater; John Harcourt, St. Ann's; J. H. Jull, Mount Vernon; W. H. Arkell, Teeswater; John E. Cousins, Harriston; Arch. McKenzie, Corwhin; R. E. Birdsall, Birdsall; Geo. McKerrow, Sussex, Wis.; W. A. Shafer, Middleton, Ohio; J. V. Cooper, Picton; Wm. Newman, Cherry Valley; Wm. Arkell, Teeswater; Jas. J. Tolton, Walkerton; L. Parkinson, Greenock; A. Elliott, Pond Mills; D. Brown, Iona; H. N. Gibson, Delaware; W. Lee, Simcoe; Prof. Craig and Prof. Curtiss, Ames, Ia. Judges nominated—Toronto: Jas. Tolton, Walkerton; Henry Arkell, Arkell. London: W. H. Arkell, Teeswater; J. L. Tolton, Walkerton.

HAMPSHIRES AND SUFFOLKS. R. Gibson, Delaware; H. Arkell, Arkell; Prof. J. A. Craig, Ames. Ia., U.S.; Ira Hiller, Thoonton, Mich.; W. H. Beattie, Wilton Grove; Jas. Bowman, Guelph; Prof. Kennedy, Columbus, Ohio, U.S.; W. R. Bowman, Mount Forest; John Kelly Shakespeare. Judge at Toronto: N. Gibson, Delaware.

LINCOLNS. J. T. Gibson, Denfield; J. H. Patrick, Ilderton; Capt. T. E. Robson, Ilderton; Graham Walker, Ilderton; Wm. Oliver, Avonbank; E. Parkinson, Eramosa; J. H. Nell, Lucan; Wm. Mitchell, Glencoe; A. W. Smith, Maple Lodge; J. M. Gardhouse, Highfield; J. Snell, Clinton; Hardy Shore, White Oak; Geo. Weeks, Glanworth.

SHROPSHIRES. R. Gibson, Delaware; G. P. Everrett, Mt. Vernon; J. Conworth, Paris; W. H. Beattie, Wilton Grove; A. Brown, Picton; R. Miller, Stouffville; J. Hanmer, Burford; J. Campbell, Woodville; D. G. Hanmer, Burford; M. Levering, Lafayette, Ind.; A. Elliott, Galt; J. Dickin, Milton West; J. S. Thompson, Cass City, Ind.; Geo. Allen, Allerton, Ill.; W. G. Pettit, Freeman; D. J. Campbell, Woodville; G. Phinn, Hespeler; Chas. Calder, Brooklin; H. N. Gibson, Delaware; Geo. Hindmarsh, Ailsa Craig; C. W. Gurney, Paris; W. E. Wright, Glanworth; J. Miller, Brougham; H. Hanmer, Burford; Prof. Curtis, Ames, Ia.; J. C. Duncan, Lewiston, N.Y.; G. McKerrow, Sussex, Wis.; Prof. Day, Guelph; S. Hagar, Plantagenet; Jos. Barnett, Rockland; Geo. L. Telfer, Paris.

MERINOS. Rock Bailey, Union; Andrew Terrell, Wooler; G. P. Everett, Mount Vernon; W. H. Beattie, Wilton Grove; W. M. Smith, Scotland; R. Shaw, Glandford Station; J. G. Hanmer, Mount Vernon; Geo. McKerrow, Sussex, Wis., U.S.

Judges Nominated. Toronto Industrial—J. C. Duncan, Lewiston, N.Y.; reserve, Geo. Phinn, Hespeler, Ont. Western Fair, London—Andrew Elliott, Galt, Ont; reserve, George Hindmarsh, Ailsa Craig, Ont. Central Fair, Ottawa—J. W. Barnett, Rockland, Ont. Provincial Winter Fair—J. C. Duncan, Lewiston, N.Y.; reserve, Robert Miller, Stouffville, Ont.

The meeting then adjourned.

FINANCIAL STATEMENT FOR THE YEAR ENDING DEC. 31st, 1901.

Receipts.

Members' fees	$ 83 00
Legislative grant	2,000 00
Total	$2,083 00

Expenditure.

Balance due treasurer as per last report	$ 337 84
Grant to Provincial Winter Fair	1,469 75
Officers' salaries	150 00
Directors' fees and expenses	85 92
Postage and stationery	72 67
Periodicals for members	55 28
Cost of reporting	4 00
Miscellaneous—	
Typewriting and office work	328 75
Telegraph and telephone	16 85
Auditor, 1900, $5.00; cleaning office, $2.00	7 00
Wages man in charge of stock cars	50 00
Balance stock car account 1900	9 87
Express, duty, etc	3 25
	$2,591 18
Balance due treasurer	508 18

Examined and found correct this 23rd day of January, 1902.

J. M. Duff, Auditor.

A. W. Smith, President.
A. P. Westervelt, Secretary.

DOMINION SHEEP BREEDERS' ASSOCIATION.

OFFICERS 1902.

President ..... R. H. HARDING, Thorndale.

Vice-President ..... J. M. GARDHOUSE, Highfield.

Secretary-Treasurer ..... A. P. WESTERVELT, Toronto.

Directors:

Cotswolds ..... D. McCRAE, Guelph.
Leicesters ..... ANDREW WHITELAW, Guelph.
Hampshires and Suffolks ..... JOHN KELLY, Shakespeare.
Dorsets ..... JOHN A. McGILLIVRAY, Uxbridge.
Southdowns ..... JOHN JACKSON, Abingdon.
Oxfords ..... JAS. TOLTON, Walkerton.
Lincolns ..... JOHN GIBSON, Denfield.
Merinos ..... W. M. SMITH, Scotland.
Shropshires ..... D. G. HANMER, Mt. Vernon.
Ontario Agricultural College ..... G. E. DAY, Gue'ph.

Auditor ..... J. M. DUFF, Guelph.

Delegates to Fair Boards:

Toronto Industrial ..... J. M. GARDHOUSE, Highfield, and JOHN JACKSON, Abingdon.

Ottawa ..... F. W. HODSON, Ottawa.
London ..... A. W. SMITH, Maple Lodge, and A. P. WESTERVELT, Toronto.

Provincial Winter Fair ..... A. W. SMITH, Maple Lodge, JOHN JACKSON, Abingdon, and JAS. TOLTON, Walkerton.

MEMBERS OF THE DOMINION SHEEP BREEDERS' ASSOCIATION, 1900 AND 1901

Name and Address.	Breed.
Arkell, Henry, Arkell	Oxfords.
Allen, Robt. G., Cooper	Cotswolds.
Allen, Robt. S, Cooper	"
Armstrong, G. B., Teeswater	Leicesters.
Barker, S. & Sons, Mt. Vernon	Cotswolds.
Blais, A. & J., St. Anne de Prescott	Leicesters.
Baker, G. & Son, Simcoe	Southdowns.
Barbarree, S., Nassagaweya	Oxfords.
Brethour, J. E., Burford	
Beattie, W. H., Wilton Grove	Shropshires.
Brien, E. & Sons, Ridgetown	Cotswolds.
Bonnycastle, F., Campbellford	"
Bowman, W. R., Mt. Forest	Shropshires.
Brown, John, Galt	Grades.
Bowman, Jas., Guelph	Suffolks, Dorsets
Brown, J. L., Uxbridge	Cotswolds.
Burns, J. H., St. Mary's	
Clark, J. W., Onondaga	Shropshires.
Campbell, John, Woodville	Shropshires.
Cooper, J. V., Picton	Oxfords
Cousins & Son, John, Harriston	"
Conworth, J., Paris	Shropshires.
Cornish, J. W., Orchard	Dorsets.
Cochrane, J. A., Hillhurst, Que	Hampshires.
Currelly, T. & Son, Fullarton	Leicesters.
DeWitt, C. H., Niagara Falls South	Cotswolds.
Donaldson, Wm., South Zorra	Shropshires.
Douglas, Jas., Caledonia	Leicesters.
Douglas, T. C., Galt	Southdowns.
Dunnet Bros, Clanbrassil	Leicesters.
Drummond, Hon. G. A., Beaconsfield, Que	Southdowns.
Elliott, A. & Son, Galt	Shropshires.
Everett, G. P., Mt. Vernon	"
Evans, David, Somenos, B.C.	
Evans, Smith, Gourock	Oxfords.
Edwards, W. C., Rockland	Shropshires.
Finlayson, Kenneth, Campbellton	Oxfords.
Ficht, Val., Oriel	Cotswolds.
Gardhouse, J. M., Highfield	Leicesters.
Garbutt, R. J., Belleville	
Gibson, J. T., Denfield	Lincolns.
Gibson, R., Delaware	Shropshires.
Gibson, W. H., Beaconsfield, Que	Southdowns.
Gould, Geo. & Son, Rutherford	Lincolns.
Gurney, C. W., Paris	
Harding, R. H., Thorndale	Dorset Horns.
Hanmer & Son, D. G., Mt. Vernon	Shropshires.
Hanmer, J. G., Mt. Vernon	"
Hastings Bros., Crosshill	Leicesters.
Hindmarsh, Geo, Ailes Craig	Shropshires.
Hine, R. J., Dutton	Oxfords.
Hood, G. B., Guelph	
Hodson, F. W., Ottawa	
Hume, Jas., Arkell	Cotswolds.
Hunter, John, Wyoming	Dorsets.
Innes, Donald, Tobique River, N.B.	Shropshires & Cotswolds.
Jackson, John, Abingdon	Southdowns.
Jeffs & Sons, E., Bond Head	Southdowns & Leicesters.
Johnston, Jas., Trafalgar	Dorset Horns.
Johnston Bros., Underwood	Leicesters.
Jull, J. H., Mt. Vernon	Oxfords.
Lloyd-Jones, T., Burford	Shropshires.
Kelly, John, Shakespeare	Hampshires, Shropshires & Leicesters.
Lewis, F. M., Burford	Shropshires.
Lemon, S., Kettleby	Southdowns.
Linton, Wm., Aurora	Cotswolds.
Millar, Geo., Markham	
Maynard, J. T., Chilliwack, B.C.	
Martin, Wm, Binbrook	Southdowns.
Martin, E. E., Canning	"
Martin, R G, Marysville	Leicesters.
Moody, Ed., Humber	
McFarland, John, Clinton	Shropshires.
McCrae, D., Guelph	Southdowns & Cotswolds.
McLees, J. H, Beaconsfield	Dorsets.
McEwen, Robt., Byron	Southdowns.
McNelly, Hugh, Arkell	Cotswolds.
McLeod, Robt. G., Lansdowne, N.S.	Oxfords.
McGillivray, J. A., Uxbridge	Dorsets.
McRobie, F., Iroquois	Leicesters.
McDonald, Jno. W., Lorat, N.S	Oxfords.
Orr & Lillico, Galt	Leicesters.
Parkinson, E., Eramosa	Lincolns.
Parkinson, L., Eramosa	Leicesters.
Parkinson, L., Greenoch	
Parkinson, G. & W, Eramosa	"
Parks, H, Woodstock	"
Phillips, F. W., Oakville	Dorset Horns.
Phin, G. B., Hespeler	Shropshires.
Rawlings, John, Ravenswood	Cotswolds.
Rawlings, S. J., Forest	Cotswolds.
Rawlings, Fred., Forest	"
Rae, W., Arkell	"
Richardson, And., Peepabun	
Robson, T. E., Ilderton	Lincolns.
Ross, J. C., Jarvis	Cotswolds.
Rudell, Abram, Hespeler	Shropshires.
Staples, L. F., Ida	
Stratford, Jas., Brantford	Dorset Horns, Shropshires.
Slater, J. W., Buttonville	Cotswolds.
Smith, Wm., Columbus	"
Stonehouse, Wm, Wyoming	Dorset Horns.
Snell, R. P., Snelgrove	
Smith, John, Beachville	Leicesters.
Switzer, N. W., Streetsville	Shropshires
Smith, A. W., Maple Lodge	Leicesters.
Smith, W. M., Fairfield Plains	Merinos
Scott, James, Aberfoyle	Southdowns.
Shopland, J. S., Maywoods, B.C.	"
Telfer Bros., Paris	"
Tolton, J. W., Walkerton	Oxfords.
Turner, Thos., Uxbridge	
Walker, T., Ilderton	Lincolns.
Wren, Chris., Uxbridge	Shropshires.
Whitelaw, A. & W., Guelph	Leicesters.
White, John, Eramosa	Lincolns.
Wright, John, Mohawk	Leicesters.
Wright, John, Chesley	"
Wood, C. & E, Freeman	"
Wellington, Wm., Forest	Cotswolds.
Wright, W. E., Glanworth	Shropshires.

DOMINION SWINE BREEDERS' ASSOCIATION.

ANNUAL MEETING.

The annual meeting of the Dominion Swine Breeders' Association convened at the Palmer House, Toronto, January 23rd, 1902, at 2.30 p.m., President William Jones in the chair.

The minutes of the last meeting were taken as read.

The Secretary-Treasurer read his annual report, which was adopted, after being taken up clause by clause.

The President congratulated the members of the Swine Breeders' Association on the splendid financial condition of the Association and the very successful season they had passed through. He believed it had been unprecedented in the history of the Association, and it was gratifying to know that the prices of swine would still be high for some time to come.

Resolutions Adopted.

"That this Association requests the directors to appoint a man to look after the live stock interests in the Northwest."

"That the President appoint a committee of three to consider the prize lists and rules and regulations governing the different exhibitions, with power to act."

The President appointed Major Hood, R. P. Snell, and J. E. Brethour to act on the above committee.

"That the Dominion Swine Breeders' Association request the Dominion Government to give the same transportation facilities to stock going to St. Louis as was given to Chicago and the Pan-American."

"That the clause in the Secretary's report in regard to grants to Western Exhibitions be adopted, and be left in the hands of the Executive Committee."

"That the President, Vice-President and Secretary be the Sale Committee."

Mr. J. G. Clark, J. C. Smith and F. W. Hodson, Dominion Live Stock Commissioner, were appointed an Eastern Sale Committee to act under the instruction of the Executive.

"That the expert judges, appointed by the breeders of the various breeds, be accepted." Carried.

Expert Judges.

The following are the expert judges nominated:

BERKSHIRES. Wm. Wilson, Snelgrove; J. C. Smith, Hintonburg; X. Plaunt, Northcote; Samuel Dolson, Alloa; Hugh G. Clark, Norval; P. W. Boynton, Dollar; Alex. Smith, Maple Lodge; Wm. Jones, Zenda; W. G. Caven, East Toronto; Jas. McEwen, Kertch; John Boyes, jr., Churchill; Henry Jones, Zenda; H. J. Davis, Woodstock; J. C. Snell, London; Thos. Teasdale, Concord; Geo. Green, Fairview; Robert Vance, Ida; T. A. Cox, Brantford; Jas. Quirie, Delaware; Jos. Featherston, Streetsville; R. P. Snell, Snelgrove; C. R. Decker, Chesterfield; Chas. Youngs, Brooksdale; D. DeCourcy, Bornholm; R. H. Harding, Thorndale; Jos. Barnett, Rockland; E. E. Martin, Canning;

H. B. Jeffs, Bond Head; Wm. Linton, Aurora; E. Brien, Ridgetown; G. B. Hood, Guelph; J. E. Brethour, Burford; Alex. Hart, Hampstead; W. A. Shields, Milton.

YORKSHIRES AND TAMWORTHS. David Barr, jr., Renfrew; A. Boyd, Kars; E. A. Kipp, Chilliwack, B.C.; Jas. Bray, Longburn, Man.; Lou Rogers, Weston; Geo. D. Betzner, Copetown; R. J. Kerr, Mimosa; W. R. Bowman, Mount Forest; Wm. Jones, Zenda; R. J. Garbutt,, Belleville; E. Dool, Hartington; R. H. Harding, Thorndale; N. M. Blain, St. George; A. Dunn, Ingersoll; J. H. Simonton, Chatham; G. North, Marden; A. Elliott, Galt; L. F. Master, Haysville; A. C. Hallman, New Dundee; D. G. Hanmer, Burford; John Nichol, Hubrey; J. E. Brethour, Burford; W. Elliott, Hamilton; A. Laurie, Wolverton; Wm. Davies, Toronto; Richard Gibson, Delaware; Henry Dodels, Kossuth; G. B. Hood, Guelph ; Joseph Featherston, Steetsville; H. E. Sharp, Ida; A. F. McGill, Hillsburg; J. G. Mair, Howick, Que.; J. M. Hurley, Belleville; Geo. Gier, Grand Valley; Jas. Stephen, Trout River, Que; R. McCulloch, Harriston; Jos. Fletcher, Oxford Mills; Robert Nichol, Brussels; A. F. Foreman, Collingwood; J. Y. Ormsby, Woodstock; Jas. Leach, Toronto; Wm. Howe, North Bruce; Chas. Yapp, Brantford; G. E. Day, Guelph; F. Shore, White Oak; H. J. Davis, Woodstock; D. C. Flatt, Mill Grove; W. R. McDonald, Ridgetown; W. Elliott, Galt; R. G. Martin, Marysville; J. E. Cousins, Harriston; Geo. Green, Fairview; J. W. Callbeck, Augustine Cove, P.E.I.; J. G. Clark, Ottawa; J. C. Smith, Hintonburg; D. Drummond, Myrtle.

SUFFOLKS AND ESSEX. Wm. Jones, Zenda; Geo. Green, Fairview; Thos. Teasdale, Concord; Jas. McGarvin, Chatham; R. H. Harding, Thorndale; Jas. Main, Milton; D. DeCourcy, Bornholm; G. B. Hood, Guelph; R. P. Snell, Snelgrove.

DUROC JERSEYS. D. C. Flatt, Mill Grove; Daniel DeCourcy, Bornholm; Major Hood, Guelph; Norman M. Blain, St. George; Geo. Green, Fairview; Wm. Jones, Zenda; Thos. Teasdale, Concord; J E. Brethour, Burford; R. H. Harding, Thorndale; W. M. Smith, Fairfield Plains; Jos. Featherston, Streetsville; W. N. Tape, Bentpath; Geo. Bennett, Charing Cross; H. George, Crampton.

POI AND CHINAS. Thos. Teasdale, Concord; Jos. Featherston, Streetsville; Jas. Main, Milton; Geo. Green, Fairview; W. M. Smith, Fairfield Plains; Wm. Jones, Zenda; Henry Jones, Zenda; Oliver Drury, Fargo; C. W. Yapp, Brantford; R. Willis, Glen Meyer; R. H. Harding, Thorndale; Lawrence Tape, Ridgetown.

CHESTER WHITES. E. D. George, Putnam; R. E. Birdsall, Birdsall; Albert Baracky, Bloomington; Wm. Jones, Zenda; J. C. Snell, London; Geo. Green, Fairview; D. DeCourcy, Bornholm; R. H. Harding, Thorndale; G. B. Hood, Guelph; Gideon Snyder, Jarvis; Jos. Featherston, Streetsville; H. George, Crampton; G. Bennett, Charing Cross; W. N. Tape, Bentpath; J. E. Brethour, Burford; J. C. Nichol, Hubrey; G. E. Day, Guelph; W. E. Wright, Glanworth. Provincial Winter Fair. G. B. Hood, Guelph.

The meeting then adjourned.

SPECIAL PRIZES OFFERED BY THE DOMINION SWINE BREEDERS' ASSOCIATION AT THE WINNIPEG FAIR.

Berkshire Boar, any age—Victor 6219, Hon, T. Greenway, Crystal City, Man.

Berkshire Sow, any age—Snell's Charmer II., J. A. McGill, Neepawa, Man.

Imp. York. Boar, any age—Summer Hill Dreyfus 3899, Hon. T. Greenway, Crystal City, Man.

Imp. York. Sow, any age—Oak Lodge Julia 11th 4242, Hon. T. Greenway, Crystal City, Man.

Tamworth Boar, any age—Dr. Leyds, 1957, W. E. Baldwin, Manitou, Man.

Tamworth Sow, any age—Maggy 333, L. A. Bradley, Portage la Prairie, Man.

Chester-White Boar, any age—Excelsior's Portage King 1286, Wm. McBride, Portage la Prairie, Man.

Chester-White Sow, any age—Dina 1539, Wm. McBride, Portage la Prairie, Man.

Poland China Boar, any age—Canadian 1499, W. M. Smith, Scotland, Ont.

Poland China Sow, any age—Lady Saunders 1364, W. L. Trann, Crystal City, Man.

Jersey Red Boar, any age—Jimmie 232, W. M. Smith, Scotland, Ont.

Jersey Red Sow, any age—Fairfield Maude, 390, W. M. Smith, Scotland, Ont.

AT THE BRANDON FAIR.

Berkshire Sow, any age—Jos. Laidler, Neepawa, Modesty 5185.

Imp. York. Sow, any age—A. B. Potter, Montgomery, Brampton, Lassie 3439.

FINANCIAL STATEMENT FOR THE YEAR ENDING DECEMBER, 31, 1901.

RECEIPTS.

Cash on hand from previous year as per last report	$510 47
Members' fees	688 00
Legislative Grant	2,000 00
Record Fees	1,410 65
Mortgage	1,000 00
Interest on Mortgage	32 02
	$5,641 14

EXPENDITURES

Grant to Provincial Winter Fair	$1,307 75
Officers' Salaries	150 00
Directors' fees and expenses	95 89
Postage and stationery	79 67
Printing	1,095 35
Periodicals for members	244 74
Cost of reporting	4 00
Typewriting and office work	332 78
Prizes at Winnipeg and Brandon fairs.	124 00
Auditor, 1900, $5.00; cleaning office, $2.00	7 00
Wages, man in charge of stock cars	50 00
Balance stock car account, 1900	$ 87
Telegraph and telephone	17 37
Express and duty	7 00
	$3,525 42
Balance on hand	2,115 72

Examined and found correct,
this 23rd day of January, 1902.

J. M. DUFF, Auditor.

WM. JONES, President.

A. P. WESTERVELT, Secretary.

DOMINION SWINE BREEDERS' ASSOCIATION.

OFFICERS FOR 1902.

President ..... G. B. Hood, Guelph.

Vice-President ..... Thos. Teasdale, Concord.

Secretary-Treasurer ..... A. P. Westervelt, Toronto.

Directors:

Berkshires ..... Geo. Green, Fairview.
Yorkshires ..... J. E. Brethour, Burford.
Chester Whites ..... R. H. Harding, Thorndale.
Poland Chinas ..... W. M. Smith, Scotland.
Duroc Jerseys ..... L. B. Tape, Ridgetown.
Tamworths ..... J. C. Smith, Hintonburgh.
Essex ..... Jos. Featherston, Streetsville
Ontario Agricultural College ..... G. E. Day, Guelph.

General Director ..... Wm. Jones, Mt. Elgin.

Auditor ..... J. M. Duff, Guelph.

Representatives to Fair Boards:

Toronto Industrial ..... D. C. Flatt, Millgrove, and R. P. Snell, Snelgrove.

Ottawa ..... A. P. Westervelt, Toronto, and J. A. Richardson, South March.

London ..... Geo. Green, Fairview, and D. DeCourcy, Bornholm.

Peterboro ..... Robt. Vance, Ida.

Guelph ..... G. B. Hood, Guelph, and Jas. Anderson, Guelph.

Belleville and Kingston ..... J. M. Hurley, M. P., Belleville.

Provincial Winter Fair ..... G. E. Day, Guelph, Wm. Jones, Mt. Elgin, and G. B. Hood, Guelph.

MEMBERS OF THE DOMINION SWINE BREEDERS' ASSOCIATION, 1901 AND 1902.

Name and Address.	Breed.
John Ackland, Delaware	Berkshires.
Armstrong, A. B., Codrington	Yorkshire.
Allison, David, Roland, Man	Berkshire.
Aberdeen, Earl of, Vernon, B.C	Tamworths.
Ash, Wm. R., North Ridge	Berkshire.
Aitchison, Wm., Erindale	Tamworth.
Adams, W. H., Churchbridge, Man.	Yorkshires.
Allen, Fred T., Hampton	Berkshire.
Branter, G., Northport, N. S	Berkshire.
Barron, J. G., Carberry, Man	Berkshires.
Baldeone & Son, Wm., Manitou	"
Bradley, L. A., Portage La Prairie	Tamworth & Berk.
Bray, James, Longburn, Man	Yorkshire.
Ball, E. N., Hamburg, Mich	Berkshire.
Brandow, A. W., Walsingham Centre	C. White.
Barr, David, Jr, Renfrew	Berkshire.
Blain, N. M., St. George	Tamworth.
Braithewaite & Bros, Jos, Lefaivre's Corners	Berkshire.
Brethour & Saunders, Burford	Yorkshire.
Bennett, Jos., South Buxton	P. Chinas.
Bennett, G. & Pardo, Charing Cross.	"
Bennett & Son, H., St. Williams	Berkshire.
Beggs, John, Arcola, Assa	"
Bedford, S. A. (Exper. Farm) Brandon, Man	York. & Berk.
Bell Estate, John, L'Amaroux	Tamworths.
Betzner, Geo. D., Copetown	Berkshire.
Brethour, J. E., Burford	Yorkshires.
Bonnycastle & Son, F., Campbellford	Berkshires.
Birdsall & Son, F., Birdsall	C. White.
Brubacher, D. S., Winterbourne	Berkshires.
Bruce, Jas, Newton Robinson	Yorkshire.
Bowman, Wm. A., Elmdale, N. Y.	"
Bowman, T. E., Berlin	Yorkshire and P. Chinas.
Brown, Ed., Boissevain, Man	Berkshires.
Brown, F. W., Portage La Prairie	Berkshire.
Bligh, E., Emerson, Man	"
Brien, Wm., Ridgetown	"
Brien & Son, E., Ridgetown	"
Brown, Augustus, Beachburg	Berkshires.
Boynton, P. W., Dollar	Berkshire
Bowman, W. R., Mt. Forest	"
Boyd, Archie, Kars	"
Brooks, Thos., Brantford	"
Bow Park Co., The, Brantford	"
Boyce, John, Jr., Churchill	"
Bowen, Herman, Woodville	Yorkshire.
Booth, Geo. K., Melboro, Que	"
Burk, John A., Amherstburg	Berkshire.
Birch, R., Anderson	Yorkshire.
Bulstrode, C. G., Q'Appelle Station, Assa	
Bolton, Frank, Marden	Berkshires.
Bothwell, Geo., Nettleton	Yorkshires.
Bothwell, Geo A., Owen Sound	
Chambers, Wm., Hayfield, Man	Tamworths.
Crawford, Thos, Camlachie	Yorkshires.
Carruthers, C. & J., Cobourg	"
Clark, W. G., Brampton	Berkshire.
Clark, Robt., Ottawa	Yorkshire.
Carpenter, W. S., Simcoe	Berkshire.
Campbell, N., Chatham	"
Clark, J. G., Ottawa	Yorkshire.
Campbell, Duncan, Norwood	Berkshire.
Carver, A. E., Colpoy's Bay	"
Chambers, D. E., Sandusky, Ohio	Yorkshires.
Callbeck, J. W., Augustine Cove, P. E. I	Berkshires and York.
Campbell, C., Guelph	Yorkshires.
Clark, J. L., Norval	
Clark, H. G., Norval	Berkshires.
Central Experimental Farm, Ottawa.	York. & Berk.
Clemons, G. W., St George	
Coxe, S. A., Brandon, Man	Berkshire.
Crozier, A., Beachburg	"
Crowell, W. N., Napinka, Man	"
Cronnolly, P. J., Middleton, P. E. I.	Yorkshire.
Cole, T. J., Bowmanville	Berk. & York.
Colwill Bros., Newcastle	Yorkshires & Tamworth.
Cox, T. A., Brantford	Berkshire.
Cousins & Son, John, Harriston	"
Copland, S. R., Harriston	"
Crooker, J. W., Lacombe, Alta	"
Collyer, F. W., Welwyn, Assa	"
Corning, H. W., Chigoggin, N. S.	Yorkshire.
Chute, H. J., Somerset, N. S	Berkshire.
Davidson, J. H., Cobourg	Yorkshires.
Davis, H. J., Woodstock	"
Day, N., Powle's Corners	Yorkshire.
Davis, J. F., Tempo	C. White.
Darling, L. A., Morganston	Yorkshires.
Derbyshire, W. W., Wheatley	
Derbyshire, J. B., Wheatley	Duroc Jerseys
Decker, C. R., Chesterfield	Berkshire.
Demaray, Chas., Strathroy	"
Dennison, W. S., Dennison's Mills, Que	C. Whites.
De Courcy, D., Bornholm	C. White.
De Veter, W. H., Woodstock, N. B.	Yorkshire.
De Hart, F. R. E., Indian Head, Assa	Berkshire.
Deeks, J. D., North Williamsburg	Yorkshire.
Dewar, Geo. A., Kertch	"
Dedels, H., Breslau	
Dyment, S., Barrie	York. & Berk.
Donaldson, Jas., Dewittville, Que.	C. White.
Dolson, Samuel, Allos	Berkshire.
Dunn, Geo., Neepswa, Man	"
Dulmage, A. E., Oberlin, Ohio	Yorkshire.
Duncalfe, W. J., Miami, Man	"
Duck & Son, F., Port Credit	"
Dunbar, John, St. Marys	Berkshires.
Duck & Son, Ira, Port Credit	Yorkshires.
Durham & Caven, East Toronto	Berkshire.
Doolittle, H., Hamlet	Yorkshire.
Douglas, J. H., Warkworth	York. & Berk.
Douglas, H. M., Bay City, Mich	Yorkshire.
D. Douglas & Sons, Mitchell	Tamworths.
Douglass, A. R., Franklin, Man	Berkshire.
Dell, Thos., Kertch	"
Evans, F. E., Mormon City, B. C	"
Easton, Andrew L., Deserouto	Yorkshire.
Endsley, Mr. & Mrs. T. I., Charleston, Ill	Tamworth.
Edwards & Co., W. C., Rockland	York & Berk.
Elliott, A. S., Galt	Yorkshires.
Elder Bros., Virden, Man	Berkshire.
Elliott, Wm., Springbank	Berkshires.
Elliott, Robert, Armstown, Que	"
Elliott, A. & Son, Galt	Tamworths.
Estdon, J. H, Curry Hill	Yorkshire.
Evans, W. J., Lawrence Station	"
Flatt, D. C., Millgrove	"
Frank & Sons, A., The Grange	"
Farmers' Operative Packing Co, Brantford	"
Fraser & Son, I. O., Fellows	Duroc Jerseys.
Featherston, Jos., Streetsville	York., Suffolk, Essex.

LIST OF MEMBERS.—*Continued.*

Name and Address.	Breed.
Fretz, J. A., Pelham Union	Yorkshire.
Fenner, A., Comber	Duroc Jerseys.
Featherston & Son, J., Streetsville	Yorkshires.
Fulton, Jr., John, Brownsville	Tamworth.
Fletcher, Geo. D., Binkham	Yorkshire.
Foster, J. G., Moira	"
Graham, A., Pomeroy, Man	Berkshire.
Garbutt, R. J., Belleville	
Glendinning, H., Manilla	"
Green, Geo., Fairview	"
George & Sons, H., Crampton	Tamworths & C. White.
Gregg & Son, H., Salford	Berkshire.
George, E. D. Putnam	Tamworth and
Greenway, Hon. Thos., Crystal City, Man.	C. Whites. Berk. & York.
Greenwood, Thos., Douglass, Man	Yorkshire.
Gibson, D. J., Bowmanville	Berkshire.
Gibson, Richard, Delaware	Yorkshires.
Gies, C. R., Heidelberg	Berk. & York.
Gough, Ed., Powassan	York. & Berk.
Groff, Israel, Alma	Berkshire.
Glendenning, John, Valentia	"
Gibson, John S., Morden, Man	Yorkshire.
Griffith, J. B., Melbourne	Berkshires.
Gordon, G. E., Laurel	Yorkshires.
Hanmer, D. G., Mt. Vernon	
Harman, R., Temperanceville	Berkshire.
Hamilton, Daniel, V.S., Harriston	Berk. & York.
Hauser, Ignatius, Weisenburg	"
Harris, Geo. N., Lynden	Yorkshire.
Hartman, J. W., Elm Hedge	"
Harding, R. H., Thorndale	Chester White
Hart, Alex., Hamstead	Berkshire.
Hallman, A. C., New Dundas	Tamworth.
Hancock, F., Woodville	Yorkshire.
Hastie, A. C., Comber	Berkshire.
Hawkshaw, W. S., Glanworth	Yorkshires.
Hales, Alf., Guelph	
Hadwin, G. H., Duncans, B. C	
Henry, J. R., Chater, Man	Berkshire.
Hetley, Wesley, Christina	"
Hickling, C. M., Barrie	Yorkshires.
Hill, Geo., Delaware	"
Hill, John, Wellesley	"
Hyde, Geo. A., Shakespeare	"
Hiller, Geo., Albuna	"
Hord & Son, John, Parkhill	Yorkshire.
Hood, G. B., Guelph	Berkshire.
Howard, W. J., Dollar	"
Hoey, J. G., Elton, Man	"
Howe, Wm., North Bruce	"
Honey, Richard, Brickley	Yorkshire.
Hoover & Sons, P. R., Green River	Tamworths.
Hodges, E. A., Hatley, Que	Yorkshire.
Hoffarth, John H., Greenock	"
Hurley, J. M., Belleville	"
Hume & Co., A., Menie	"
Hart, Henry, Nilestown	"
Hutchison, L. E., Neepawa, Man	Berkshires.
Huggins, Alf., Courtice	Yorkshire.
Irwin, Geo., Nicolston	Yorkshires.
Israel, John, Mt. Lehman, B. C	"
James, E. A., Kertch	Berkshires
Jarvies, Robert, Nanaimo, B. C	
James, Walter, Rosser, Man	Berkshires.
Jeffs & Son, E., Bondhead	"
Jones, Wm., Zenda	Poland Chinas.
Johnston, B., Rodney	Berkshire.
Johnston, A., Vandeleur	"
Johnston Bros., Underwood	Berkshires.
Johnston, D. B., Lansdowne	Yorkshires.
Johnston, Ira, Balmoral	Yorkshires.
Jarvis & Bro., R. L., Harwich	Duroc Jersey.
Kerr, R. J., Mimosa	Berkshire.

Name and Address.	Breed.
Kitchin, John, Corwhin	P. Chinas and Berkshires.
King, W. P. & G., Oakwood	Tamworths.
Keough, James, Rockwood	Berkshires & Yorkshire.
Keeler, J. C., Dartmouth, N. S	Berkshires.
King Bros., Wawanesa, Man	Yorkshires.
King, Oliver, Wawanesa, Man	Berkshires.
Kitson, William, Burnside, Man	Berkshire.
Kipp, H., Chilliwack, B.C	"
Kirkland, Thos., Yorkton, Assa	"
Latimer, Bros., Arkport, N.Y	Yorkshires.
Laidler, Jos., Neepawa, Man	Berkshire.
Laird, J. R. Guelph	Yorkshire.
Latimer, W. A., Woodstock	"
Lahmer, John, Vine	Berkshire.
Lang, R. L., Oak Lake, Man	"
Lemon, S., Kettleby	Berkshires.
Lee, J. N., Simcoe	Berkshire.
Leatherdale, Elias, Morden, Man	"
Lee & Son, Jos., Dunham, Que	"
Lee, J. W. & Sons, Simcoe	"
Little, John, Henfryn	Yorkshire.
Little, jr., Thos., Kirkwall	Berkshire.
Livingston, W. A., Allan Park	Yorkshire.
Little, A. E., Allandale	"
Liebrock, Wm., Leamington	
Lyons, S. J., Norval	Berkshires.
Logan Bros., Amherst Point, N.S	
Loughead, Albert, Rowden, Alta	Berkshire.
Lenz, A. C., Shilson, Man	"
Lindsay, R. H., Copenhagen	Yorkshire.
Lampman, J. H., Palmyra	Berkshire.
Lowden, M. L., Binbrook	Tamworths.
Master, Levi, Haysville	Yorkshire.
Mannerow, A. & L., Desboro'	Berkshire.
Mayloney, F. A., Chapeau, Que	Yorkshire.
Mark, G. H., Oakwood	"
Marsh, E. & Son, Gladstone	"
Martin, R. G., Marysville	"
Martin, E. E., Canning	Berkshires.
Mandeville, David, Kadende, Man	"
Martin, W. H., Warden, Que	"
Marlott & Chalk, Yarmouth Centre.	
Mather, R., Deerbrook	Yorkshires.
Matheson, D., Coningsby	
Marks, S. A., Chippewa Bay, St. Lawrence Co., New York	
Mercer, Thos., Markdale	Berkshire.
Meldrum, Alex., Billerica, Que	"
Myles, J. & G., Heathcote	Tamworths.
Miller, Geo. A., Feversham	Berkshires.
Minnis, Chas., Leamington	Berk. & York.
Mitchell & Son, C. N., Pt. Elgin	Yorkshires.
Miller, David, Maplewood	Yorkshires.
Morrell, F. A., Way's Mills, Que	C. White.
Morrow, R. O., Hilton	Tamworth.
Moore, Chas., Scotch Lake, N.B	Yorkshire.
Moore, W. J., Lindsay	"
Mortson, W. H., Beausejour, Man	"
Moulton, Wm., Dawn Valley	Berkshires.
Murphy, R. G., Elgin	Yorkshire.
Murray, Thos., Avonton	Berk & York.
Murray, Geo. H., Innerkip	Berkshire.
Murray, G. H., Oakwood	Yorkshires.
Mulloy, W. J., Winchester	Yorkshires.
Mutch, J. F., Pilot Mound, Man	Tamworth.
McAvoy, T. C., Balsam	Berkshire.
McKellar, John M., Belmont	Yorkshire.
McGill, J. A., Neepawa, Man	Berkshire.
McEwen, Jas., Kertch	"
Moore, W. J., Lindsay	Yorkshire.
McDonald, J. B., Muirkirk	Berkshire.
McArthur, Wm., Gobles	"
McAvoy, C. C., Atha	"

LIST OF MEMBERS —*Concluded.*

Name and Address.	Breed.
McCrae, David, Guelph	Berkshires.
McCrae, Wm., Guelph	"
McCabe, Anson, Mt. Wolfe	"
McPhail, A., Brandon, Man	"
McKay, J. F., Parkhill	Yorkshire.
McDowell, H. T., Shawville, Que	Berkshires.
McDonald, R. N., Morganston	"
McDairmid, D. R., Ridgetown	Berkshires.
McPherson, Alex., Rutherford	Chester Whites.
McEvers, Henry, Teeswater	Yorkshire.
McKenzie, R , High Bluff, Man	Berkshire.
McGregor, Alex., Rapid City, Man	"
McEwens, Jas , Minnedosa, Man	"
McPherson, John, Campbellton	Yorkshire.
McLennayhan, Thos., Oxford Mills	"
McIntosh, Peter, Cass Bridge	Berkshire.
McDonald, W. R., Ridgetown	Tamworths.
McCole, Anson, Mount Wolfe	Yorkshires.
McDermid, H. L., Headlingly	"
McClure, B. A., Meadowvale	"
Nauman, A., Fisherville	Berkshire.
Newell, Hy., Kilbride	"
Ness, R. Howick, Que	Yorkshires.
Nichol, J. C., Hubrey	Tamworth.
Nichol, Alex., Alexander, Man	Berk & York.
Nichols, Robt., Brussels	Berkshires & Tamworths.
North, Geo., Marden	Tamworths.
Nunn, Cephas, Winslow Road, P.E.I.	Yorkshire.
O'Brien, John, London West	
Oliver, Wm, Komoko	Yorkshire.
Ontario Agricultural College, Guelph	York. & Berk.
Ouellette, D. & A., Vickers	Berkshire.
Owens, Hon. Wm., Montreal	Yorkshires.
Ormiston, Wm., Columbus	"
Pearce, John P., Staples	"
Plaunt, X., Northcote	"
Parlee, M. H., Sussex, N. B	"
Paget, John, Sundridge	"
Patch, Frank D., Brome, Que	C. White.
Patch, C. W., Brome, Que	Berkshires.
Paterson, Wm., Churchill	Yorkshires.
Phillips, W N., Keyes, Man	"
Philips, F. W., Oakville	"
Pomeroy, W. J., Belmore	Berkshire.
Potter, A. B., Montgomery, Assa	Yorkshire.
Reid, Isaac, Ardtrea	Berkshire.
Reid & Co., R., Hintonburg	Berk. & Tam.
Rettie, Jas., Norwich	
Richardson, John A., South March	Yorkshires.
Rickert, Cyrus, Manheim	"
Rich, W. P., Clark	Berkshires.
Rice, Geo., Currie's Crossing	
Ross, A. W., Bromley	Yorkshires
Roddick, R. F., Braeden Hills, Man.	
Root, Frank, Pittsfield, Ohio	"
Rogers, L., Weston	"
Robertson, R., Ex. Frm, Nappan, N.S.	Berk. & York.
Robertson, D. A., Logoch, Man	Yorkshires.
Runcinan, Geo. A., Warkworth	C. White.
Russell, Frank, Cedarville	Berkshire.
Ruston, J. F , Woodslee	"
Russell, Jas. A., Precious Corner	Yorkshire.
Rudd, W. J., Eden Mills	Berkshires.
Ruthven, R., Clarksburg	"
Reilly, Herbert, Neepawa, Man	"
Shaw, Helen, Calgary, Alta	"
Shaw, A. J. C., Thamesville	"
Scanlan Bros., Ennotville	"
Standeaven & Sons, F., St. Mary's.	Yorkshires.
Shaw, K. A., Simcoe	Berkshire.
Shannon Bros., Cloverdale, B.C	"
Snell & Lyons, Snelgrove	"
Sheperdson, N. J., Walters Falls	"

Name and Address.	Breed.
Seymour, R. F., Essex	Berkshire.
Spencer, W. H., Guilds	"
Selby, N. T., Newcastle	Tamworths.
Sperr, John, Yeovil	Yorkshires.
Snyder, L. W., Piqua, Ohio	"
Smyth, R L , Fargo	P. Chinas.
Srigley, John, Allandale	Yorkshire.
Siprell & Carroll, Carholme	P. Chinas.
Sieffert, J H., North Bruce	Berkshire.
Smith, W. M., Fairfield Plains	P. Chinas.
Stiver, Byron, Mouot Albert	Yorkshire.
Smith, Jas., Harrietsville	Berkshire.
Snell, J. H., Hagersville	"
Smith, W. J., Kilsyth	"
Smith, Jas., Mossley	Yorkshire.
Smith, Dr. W. H., Carman, Man	
Silverthorn, Jos., Scotland	"
Scott, Jacob, Stonewall, Man.	"
Scott, Wm., Glasgow	"
Shore & Son, Frank R., White Oak.	"
Stevenson, A., Attwood	"
Schnurr, H., Formosa	"
Sherwood, T , Fergus	Berkshire.
Styles, Wm. G., Rosser, Man	"
Stewart, F. B., Espyville Sta., Pa	Yorkshire.
Stewart, J. J., Gladstone, Man	Berkshire.
Savigny, Bruce, Peterborough	Yorkshire.
Scott, R. C., Galt	"
Snowden, S., Bowmanville	"
Taylor, Geo., Rockwood	"
Taylor, Jas., Oakwood	"
Traun, Geo. J., Mongolia	"
Tape Bros., Ridgetown	Duroc Jerseys.
Tape, Wm., Rentpath	"
Trann, W. L , Crystal City, Man	York. & Berk.
Trann, W. H., Cedar Grove	Yorkshire.
Teasdale, Thos., Concord	Berkshires.
Terrill, A., Wooler	Yorkshire.
Teasdale, T. W., Dollar	Berkshires.
Teasdale, Wm , Dollar	"
Tillsoo, E. D., Tillsonburg	Yorkshires.
Trick, Richard, Wicklow	"
Treverton, T. C., Belleville	Berkshires.
Thomas, J. P., Streetsville	Yorkshire.
Thompson & Son, S. J., St. James, Man	Berkshire.
Thompson, Jos., Sardis, B.C	C. Whites.
Thompson, J. W., Hewitt	Yorkshires.
Tufts & Son, Robt., Tweed	"
Turner, Richard, Arkona	Berkshire.
Tumelty, W. I., Madoc	Yorkshire.
Thurston Bros , Oak Heights	"
Turner, John, Inwood	Yorkshires.
Twiss, Jas. B., Woodburn	Tamworths.
Tufts, A. H., Tweed	Yorkshire.
Tuttle, Fred., Iroquois	
Thompson, L. E , Deloraine, Man	Berkshire.
Vance & Sons, Ida	"
Wallace, R. A., High River, Alta	Yorkshire.
Whaley, Wm. J., Dereham Centre	Duroc Jersey.
Wells, Jas., Virden, Man	Berkshire.
Wells & Son, A. C., Chilliwack, B.C.	"
Wilson, Mrs. A. J., Pittsfield, Ohio	Yorkshire.
Wilson, P. H. Chilliwack, B.C	Berkshires.
Whitman, Sam., Souris, Man	Tamworth.
Wilson, Wm., Snelgrove	Berkshire.
Wills, Henry, Winger, Ont	Yorkshire.
Whitely, M. H., Emerson, Man	Berkshire.
Wylie Bros., Cardinal	P. Chinas.
Wiley, Nelson, Wisbeach	Tamworths.
Wilson, Wm., Snelgrove	Berkshire.
Willis, R., jr , Glen Meyer	P. Chinas.
Wood, J. E., Langbank	Yorkshire.
Yuill, Jos., Carleton Place	"

REPORT OF MEETINGS AND LECTURES HELD IN CONNECTION WITH PROVINCIAL WINTER FAIR, 1901.

PUBLIC MEETING.

Hon. John Dryden, Minister of Agriculture for Ontario, who occupied the chair, opened the meeting with the following address: I do not think that the Committee of Management could have conferred on me a greater honor that to ask me to preside at this grand meeting to-night. It is a gathering that has perhaps never been equalled in this country, considering its representative character. We have here representatives of the best thought and the best skill in agriculture from almost every county in Ontario, and, in addition, we have gentlemen from the Provinces in the far east and the far west, and we are thus combining east and west and centre in one common nationality. This meeting looks to the future. We work at this great gathering for one common purpose, and I see in it great possibilities—possibilities of usefulness and of power in perfecting the products of agriculture. May I be permitted to give you the true name of this meeting? I think this is a twentieth century gathering. What we have in Guelph to-day is a twentieth century fair, for no such fair could have been held in the nineteenth century, because we were not prepared for it. It is the result of ten or more years of organized effort in connection with agriculture in this Province.

Last week I had the pleasure of visiting the great International Live Stock Exposition in Chicago—the greatest live stock exposition ever held in the world. That is saying a great deal; but I do not think it is saying too much. It was the greatest in number of entries, the greatest in the number of animals, and not only in the number, but also in the superior excellence of those animals; so great that few of us saw it all; we could only take in a few branches of it in the time allowed us in visiting Chicago.

While that was the greatest exposition, I want to say that I consider this the best exhibition yet held on this continent. Why do I say that? Because of its educational character—because of the educational effect it will have on the people of this country. We have made at this exhibition a distinct advance. We have gone further than they have in Chicago in this educational work. I may say that the gentleman who superintended that exhibition is himself a Canadian, and that he received his first inspiration from visiting the exhibition of these Associations a few years ago. He lives in such a great country, and Chicago is such a great centre, that they have gathered together animals from all over the world almost, some coming from Great Britain, a great many from Canada and from all the States of the Union. It is not any wonder therefore that it is great in extent. But they had none of the educational features of this exhibition. This is a revelation to some people. This vast audience itself indicates the interest the people have in these things. The people are thirsting for information on these topics, and we want to give them that information so far as we can. The object of it all is to lead to superior production in the various lines we are discussing at this exhibition. We have learned by this exhibition that it is no longer necessary to have a horse race or a mountebank performance so as to induce people to attend. There is nothing of that kind here. It is solid work and solid fact we are giving to the people, and they come in crowds to receive it. When we get our people educated to manage the exhibitions of this country—when we get them filled with the idea that the people want to know something that they do not know about their business, they will turn their attention in a different direction in order to attract crowds to their exhibition.

Politicians in these days talk a great deal about the "Forward Policy," and we like to hear them talk and act along that line. May I suggest that they are only imitating your work in connection with agriculture? We have been pursuing such a policy for twelve years in this Province. If it had not been for that we could never have held this exhibition here to-day. My chief, Mr. Ross, and we are all glad to have him with us this evening, says in his speeches that "We are bound to build up Ontario." We like to hear him say it; but I want to suggest that he is looking into the faces of the men he must expect to accomplish this thing. You are the men who have been building, and will in the future continue to build up this Province, and fill it with wealth. I have told him before that he would see here the best audience he ever looked upon. We shall find out later whether he thinks I have been telling the truth or not.

I am sure your position here this evening will be a very pleasant one. I see by the programme that we have a mingling of eloquence and music. It will be a relaxation after the hard work we have done most of the day in the class rooms, trying to give and receive the instruction we were looking for.

ADDRESS OF WELCOME.

By the Mayor of Guelph.

The Winter Fair Board have invited me as Mayor of the city of Guelph to come here and speak a few words of welcome to you this evening. I assure you it is very gratifying to me to do so, and to see before me such a large audience—composed almost entirely of men who are strangers to me and strangers to our city—as fills this hall to-night. You are here as stock men and farmers and represent the greatest of all interests in this country. It is gratifying that these interests have been recognized by the representative of royalty here to-day—his Excellency, the Governor-General. So great has the interest in this fair become that it seems probable that we shall have to ask the Government to assist us in extending the building for your accommodation. We have plenty of room to do so to the south of the track. The city and county have already come to the front and expended some $20,000 in the interest of the show, and I assure you you will find us always ready to continue our assistance. I hope that the fair will continue to prosper.

I am sure you will appreciate listening to the speakers I see on the programme, and it would be inappropriate for me to detain the meeting, beyond expressing the since welcome the city extends to you on this as on previous occasions.

The Chairman: It is a great thing to have a Government that you can lean on. I think the Mayor may very well boast of what the city has done in connection with the fair building. I do not live in Guelph, but wherever I go I am ready to speak a good word for this city because of what it has done in behalf of agriculture. You were the means of bringing a great benefit to this part of the country, and you have made the city the agricultural centre of the Province. It is a great thing to do. The Government did a little, and stirred up the people. If it is necessary, we will do more. We cannot stop this great show for lack of a little room. If we must have more room to spread ourselves, I think we shall be able to accomplish it. Very likely we shall ask the city to lead the way as they did before, and I have no doubt they will be ready to meet the occasion. The live stock men have no better friend than Dr. Mills, the President of the Agricultural College, whom I have pleasure in introducing.

ADDRESS BY DR. JAMES MILLS, PRESIDENT O.A.C., GUELPH.

Aa President of your Provincial Agricultural College and in some sense a Guelph man, I am delighted to see such a fine audience here this evening. It will delight the heart of the Premier himself as it does that of the Minister of Agriculture. I am sure it will equally delight the Minister of Agriculture for the Dominion, who is with us also. We have here to-night lawyers, doctors, journalists and all kinds of people, but especially farmers, and I am very much pleased to see here such a large representation of the farmers from this Province, and from outside of the Province.

You read from time to time of the "Old Boys" reunions in the county towns, and you see in that connection the names of eminent judges, lawyers, doctors and politicians. Their names are mentioned and their records are referred to as a credit to this or the other part of the Province. You have heard a great deal of this during the last year or two, and it is as it should be. But I think sometimes there is a danger of our forgetting a large and important class which, as has been suggested by the Minister of Agriculture, has as much to do with establishing and maintaining the prosperity of this country as any other class of the community, that is the farmers of this fine Dominion. My observation and experience, extending through many years, have led me to the conclusion, deliberately formed, that on the matter of brains and morals the farmers as a class surpass all others. I ask these gentlemen on the platform where all our leaders in professional, industrial and commercial life come from? Is it not from the farms of the country? Where, then, do the brains come from that lead in all these avenues of trade?

It is not necessary to refer to the stability and moral character of the farming community. These things are admitted everywhere. I do not hesitate to maintain that in these two important principles the farmers stand ahead of any class as a class, taking them as they come, good, bad and indifferent. I am speaking of our own farmers in the Dominion, and I venture to say that in no country—and I say it honestly—can you point to a more intelligent and progressive class of farmers than we have in this Dominion. In the great International Exposition in which our farmers took a prominent part, as at Philadelphia, Chicago and Buffalo, have not the results been a surprise to everyone—that our people, a mere handful in this Dominion, in competition with the continent, and especially with the great republic to the south with its seventy millions—have been able to make such an extraordinary record, one that any people might be proud of, in live stock, poultry and even in fruit?

It is not a question of entering into a competition with one State, but it is often with the whole Union that this small people is able to hold its own, and a little more. An American recently asked how is it that Canadians with only one-third of the entries took fifty per cent. of the prizes? The recent judging competition by students in Chicago is an instance. In this competition ten or twelve colleges competed. Iowa stood first, and the professor who instructed the team was a graduate of our college. The Ontario Agricultural College team, instructed by our own Professor Day, stood second. Illinois stood third, trained by an American. Michigan stood fourth, trained by one of our graduates, and Wisconsin fifth, trained by another of our graduates.

How is it that our farmers have been so successful? Is it because of their superior educational advantages? I do not think so. It is due to the men themselves. In the Dominion we have such a blending of nationalities—English, Scotch, Irish and some Germans—as to produce the very highest type of intellectual skill and excellence. That is what tells. It is brains. Our people have learned the value of industry, and the value of time, and they have the brains to work these problems out. I want to say that in all undertakings, great and small, it is the man that tells. If you are going into a joint stock concern you want to know who the manager is. If you are considering whether you should support a Government or not, you want to know who

the Premier is. (Applause and laughter.) It is the man that tells every time. These fat stock shows and this special education such as we have here and at the college all tend to lift to a higher industrial level and to add to the wealth of the country. Therefore this show is a great benefit to our people. I agree with the Minister of Agriculture in magnifying its educational side. We want to make the boys who are coming up more progressive, intelligent and successful than their fathers have been, and they will have to be wide awake if they are to surpass the old boys whom I see before me to-night.

I unite with the Mayor in welcoming you. Guelph has become the rallying place of the farmers of this country. You know that it is when we have you here to the number of thirty thousand in the mouth of June. We have never been charged in all the years I have been here with failing to make the farmers welcome, and we are glad to see you now as on other occasions.

The Chairman: Lest some of you do not know, I should like to tell you that in our Legislature we have two parties. One is said to be the opposite of the other. I should not like to tell you who is the most eloquent man or where he sits. But I can easily tell you who is the best singer. It is Captain Robson; I have pleasure in introducing him. After a song by Capt. Robson, M.P.P., the Hon. Sydney Fisher was called upon to address the meeting.

ADDRESS BY HON. SYDNEY FISHER, DOMINION MINISTER OF AGRICULTURE.

I am always glad to come to Guelph, where I find the live stock interests of the country so well represented. You said, sir, that you have been honored this year by the presence of his Excellency the Governor-General. I am glad if in any sense I have been instrumental in bringing that about. It is fit and right that the royal city of Guelph should be visited by the representative of royalty in Canada. It is still more fitting that royalty—which in the old land takes such an active interest in live stock and carries off so many of the prizes there—should come in the person of his Excellency to the greatest live stock exhibition in Canada. I was specially anxious that he should come here and see what the farmers of Ontario could produce in live stock; that he should compare your exhibition here and the animals and the people at it with the people and the animals he has so often seen on similar occasions in the old land. I was not afraid of the comparison. This country is becoming, and Ontario especially, to the continent of America what the old land is to-day to the whole world—the cradle from whence breeding stock goes to improve the stock of all parts of the world. Here in America, Ontario has that proud position, not only from the other Provinces, but all over that great Union to the south; when they want to improve their stock, they come to Ontario, just as when they want men to teach agriculture in other colleges they come to Guelph.

I always like to come to these gatherings, because I find I can learn a great deal. It has been one of the constant regrets of my life that I could not as a young man come to the Agricultural College, or I might have been a better farmer than I have been. Those of us who are too old, and too busy perhaps, to come to the college, can come to these gatherings and learn from men who have the practical experience as well as the theoretical knowledge of these subjects.

You spoke, sir, of the educational aspects of this exhibition. I believe they are the more important aspects of it, and that the work that is done in the lecture room and outside, where the overflow meetings had to be held to-day, is the proper and fitting and necessary adjunct to the exhibition of the animals and the competition for the prizes. It is true that if our farmers come to the show and see the animals that are competing, and see where the red tickets are put on, they can learn something; but many of us are often a little in the dark as to the points of excellence in an

animal that induced the judges to award it the first place. But when we find men who can come forward and point out the practical value of the animal before us, we ought to understand far better what the typical animal should be, and what we must aim for if we want to carry off these coveted prizes. We see the best product of the best skill of the farmers of the country, and learn how to imitate them in the work.

There is one thing I should like to say. Dr. Mills a few minutes ago spoke of the college. I have this to say of the Guelph College that while there may be others as well equipped—a few—and some that go into scientific research as far, or even a little farther, I am satisfied that there is not a similar institution either in the old land or in the Union which is so helpful and so close to the ordinary farmers and to the objects for which they are working. In this and through this is the greatest boast of your college.

Last night Professor Wylie, who was visiting us from Washington, said that he had learned a good deal since coming here, but there was not thing that he had not expected to learn, and that was how to boast; he thought his own people had the monopoly of that characteristic. I do not call that in the slightest degree a reflection upon us. Our American cousins have the conviction that everything is within their reach, and that they can accomplish everything. I think that we can take a lesson in this respect; that we should feel the same confidence in ourselves and in our country and if it renders us a little boastful, I am sure it will be preceded by achievements that justify it. It is a matter of history that the people of the north have led in the progress of the world. We in the future are going to take the same strong position and the same pre-eminence that the northmen on the continent of Europe have been able to take. Our young men who have been drawn to the United States have not been the hewers of wood and the drawers of water, but have pushed to the front and are occupying some of the best positions in the community.

But I am glad to know that this stream of our best young men going to the American Union has stopped, because to-day in our own land our best youth is finding abundant scope for its activities, and that they are remaining at home to build up our own country.

I feel that I cannot too often or too earnestly insist that our live stock interests are the best part of our agriculure, and that it must and shall be through the putting of the growing material of our crops into our live stock that we shall exalt to the first place the best skill and intelligence of which we are capable, and at the same time reap the best reward. It is easy to raise a crop and sell it; but it requires far more intelligence and skill to feed it to animals and make these animals reap a good profit from the products of the soil. That is the reason why we meet the best and the broadest and the most successful of our farmers at a live stock gathering. Keep this always before you; hold it up to your young men and thereby induce them to stay upon the farms, because they have in that calling an abundant and wide opportunity for the best skill and intelligence and education.

I am glad to know to-day that agriculture is prospering in Canada. As minister for the Dominion it is my duty to overlook the whole field. I find to-day that all through the Dominion the farmers are prospering and doing well. It has been part of the duty of my department to take the census. All the figures are not yet available, and I can give you only one or two points. Comparing the condition of agriculture ten years ago and this year I tried to work out the agricultural production in a few representative agricultural counties. I took two in Ontario, two in Quebec and two in the Maritime Provinces. One fact seems to be deplorable. I was able to take counties in which the population had decreased instead of increased during the last ten years. In each of these counties the population had materially decreased in numbers, but the actual agricultural production in these six counties aggregated more than double what was produced in 1891. This shows that the farmers of Canada as represented in these counties while fewer in numbers than in 1891, had been able to produce and take profits from more than double the agricultural production

of ten years ago. This is an extraordinary condition of affairs. I do not mean to say that this is the condition over the whole Dominion. These were old counties where all the land was producing in 1891. Part of the increase has been in actual production, and part in the value of the products. I believe this result is largely due to the application of intelligence and skill in agriculture. I believe it is largely due to the influences that have come out among our farmers of just such gatherings as this, where in the last ten years the men who are the leaders in this work have met together, have been experimenting, have been comparing notes, and thereby have been able to improve their mthods and processes so as to accomplish this result.

I am glad to know that here in this city you have to-day the great body of the Institute workers of the Province. These men, and the others who are here, are going out over the country to hold smaller meetings—are going out even to the backwoods, work-a-day farmer who is neither willing nor able to come to such a central gathering as this. While we are proud of this great gathering, we must remember that a work equally as important and equally as good is being done by the men who go into the back settlements to teach a handful of men and help these men who need help more than you do who are the leading men in the craft. The Farmers' Institute work in this Province is thoroughly organized. The system is doing splendid work. I believe it is the best educational work that is going on in the Dominion. It must extend to other Provinces, and for the last two or three years it has been my duty and privilege to try to introduce this kind of organization and work into the other Provinces, which have been behind yours in carrying it out. In the Maritime Provinces to-day this work is now pretty thoroughly organized, and also in the Province of Manitoba, and in the great west, the work is going on so far as the great distances and scattered population will allow. They are organizing in British Columbia and in Quebec they are organizing and helping on the work. The result will be good for you here as well as in the other Provinces, because you are the key, the centre of the Dominion agriculturally speaking. Your prosperity and progress and advancement must go hand in hand with the progress of your sister Provinces. If anything can be done—if any influence can go out to help these other people—it is for your good as well as theirs, and I am sure you will be glad to render all the help you can.

I have spoken rather longer than I intended for I know you have yet to listen to your Prime Minister, Mr. Ross, who is not a farmer unfortunately for him. But I believe he was born on a farm, and that this is one of the reasons he holds the high and honorable position he does to-day. I think it is good for politicians who are not farmers to come among us who are and learn a little of the way we do our work; and perhaps the work of the whole country might taken an example from such a gathering as this.

One thing I want to say. I have been here for several years; I have gone over the ground and seen the stock and have responded to the speeches. You have done a great deal in providing accommodation. You did what we all thought was all that would be necessary a few years ago. But you are so much crowded that I fear it will be difficult to do effective work with your present accommodation. I want to ask Mr. Ross, who is responsible for the finances of this Province, to see that, along with Guelph and the neighborhood the Government is not backward in providing a good auditorium so that the educational part of the fair may go on more comfortably than has been the case. Perhaps two auditoriums will be necessary, so that two addresses may be carried on at the same time. I am sure you will find the audiences to listen to men who give such addresses. I hope to find accommodation here in the near future where the speakers and audience will alike be made comfortable.

The Chairman: The Minister did not say quite what he intended, I think. He seems to forget that there is a Dominion Government with heaps of money to spare. I thought he would say that he was going back to Ottawa to help us out.

Following the line of his remarks, let me give you a few figures to indicate how we have grown. Last year the receipts were twice as much as ever before. The receipts this year up to to-night are fully twice as much as last year up to that time.

We have Farmers' Institute members here from every county in Ontario. The number last year was 1,500. The number that have passed the gates this year up to the present time is more than 2,000. This is the way we are growing in importance and influence.

We can accomplish no great work unless we have a leader. I am glad to say that we have my leader on the platform to-night. Ordinarily, I am subject to him: When he says "go" I go; when he says "come" I come. But he dare not turn round to-night, and he dare not get up to say anything till I tell him when. I have required of him very little, but it is this: I have commanded him to deliver one of his best speeches, inasmuch as he is speaking to the people whom I represent in the Government, and I have forbidden him to talk politics, except in a very indirect way. (Laughter and applause.)

ADDRESS BY HON. GEO. W. ROSS, PREMIER OF ONTARIO.

After a complimentary reference to Guelph and its inhabitants, the Premier went on to say: I heard so much from my esteemed colleague about this fair last year--"It was a great fair; there never was a fair like it in Ontario—in Canada—on this continent." It grew larger and larger the more he spoke about it. (Laughter.) It was very pleasant to think of coming to see this new departure in agricultural education, because that is what this fair is if it is what it is intended to be.

When Caesar conquered Gaul, he said: "I came, I saw, I conquered." I came, I saw, and I am satisfied. I think I can believe Mr. Dryden after this with greater readiness. It is great in what you see; it is great in what you hear. I have both seen and heard a great deal, and have seen and heard nothing but what pleases me. Of course, I cannot speak with much authority here. There are places where I can speak with authority, and there are subjects on which I claim to speak authoritatively. But having come from the farm, and having learned since I came here that all the brains in the country come from the farms, I think I can speak with a reasonable knowledge upon what is presented to me and what I hear. I am glad to believe that this effort has been made through the enterprise of the Live Stock Associations, and through the co-operation of the Agricultural College, and in a certain sense also through the co-operation of the Department of Agriculture at Ottawa. I like these combinations, particularly good combinations, you know—combinations for the promotion of education or for the promotion of any great public enterprise. And it is pleasant for me having some share in the development of Ontario, to feel that at a meeting like this we have the hearty co-operation of the Department of Agriculture at Ottawa and of the staff of the Experimental Farm. That is as it ought to be, and as it always, I hope will be. The Psalmist says, "Behold how good and pleasant a thing it is for brethren to dwell together in unity." All good men should unite for good purposes. The Department of Agriculture at Toronto cannot do better than help overcome the weaknesses of the Department of Agriculture at Ottawa, and vice versa, as regards the Department at Toronto—if that Department has any weaknesses, which is of course a debatable question.

Two features of this exhibition struck me very much first, the large representation of live stock, and, second, the excellent and instructive lectures that are being delivered by experts. A cynic once said, "Behold how little wisdom it takes to rule the world." Anyone listening to such lectures would say, "Behold how much wisdom it is necessary to have to be a good farmer." We cannot be successful at anything without knowledge, education and instruction. You cannot be a good politician unless you know something—what you ought to do and what you ought not to do. The lectures delivered this afternoon are exactly on the line of the instruction given in connection with the Teachers' Association, which have been delivered before the

teachers of this country from year to year. As Minister of Education, I always felt that if we could raise the standard of the teaching profession, we could raise the standard of the education of this country. The pupil cannot rise above the intelligence of the teacher. So coming to agriculture, we have presented here the best intelligence of the agriculturist, and it is not theoretical alone, it is more than that; you cannot have good practice without a sound theory. You cannot have much religion without good morals. You must have the practice and the theory together. That appears to be the purpose of this course of lectures. That is the only way in which a practical profession can be taught at all. If you go into our schools of engineering, you will see all the appliances of the engineer in that school, and this is to teach the engineer the principles underlying his practical work. This afternoon I heard a lecture on the points of a sheep—as to its growth, its marketable value, and as to how it could be made to yield more profit. the last point being the sum and substance of the whole matter. I never knew that a sheep had so many points. The only point that I knew in my early days was where it could be very offensive. This is the theory of successful live stock culture as I am taught to believe it, and I thought I read into that lecture a species of intelligence and interest which would mean every man taking more interest in breeding the right kind of sheep, and in feeding them in the proper manner, and seeing that his work yielded him, scientifically and not accidentally, a source of profit.

The agriculturists of this Province are not behind in the race. Why is it they are so far advanced ? It is not only your climate and your soil, nor is it simply the fact that we are of that race which is both progressive and intellectual, and which is in the main scientific; it is not that alone, but it is because your agricultural societies, started sixty or seventy years ago, as far back as 1830, began the work of education through the township and county fairs. Latterly the work has been continued principally through this great Agricultural College. It is a great college with a most efficient principal, and an able staff, loyal and devoted to its duties. Subsequently it has been continued through the travelling dairies, the Farmers' Institutes, the meetings of the Live Stock Associations, and through more or less agriculture taught in the public schools—and I trust it will be more in a short time—and though the general diffusion of intelligence which comes from a higher plane of education. These are the reasons we have made the progress we have. If you will take a word from me—a word that applies equally to a thousand other conditions of life—let it be that the future questions of the farmer, his success, his rank in competition with the farmers of other countries, will depend upon such work as is being done here—upon the thoughtful, scientific skill that is put into every department of the farmer's work. There is no other basis for success, either in farming or in professional life. If a doctor wants to succeed what does he do ? He studies chemistry and biology and every other branch of learning connected with his profession. He goes through a course of training of the most arduous character, so that he may be successful. So with the lawyer; he practises upon your difficulties and upon your pockets; he practises upon your neighbors, upon corporations, and sometimes upon Governments, and in this way he sharpens his wit. The farmer must sharpen his in the same way. In listening to that lecture this thought passed through my mind—How much knowledge a farmer really requires to be in the front rank of his profession. He requires to be a mineralogist and chemist to understand the composition of soils and foods; he needs to be a botanist to understand plant life, a naturalist to understand the habits of animals, and an entomologist to understand insect life. He must also be a bacteriologist that he may study these microbes which seem to be found everywhere in this twentieth century. We encounter them as tuberculosis in cattle, and in a thousand other ways. There is not a branch of science you can mention which is not useful to the farmer; even political economy, and on Sundays a little theology.

Seeing that the farmer's profession is more comprehensive than that of the lawyer, or the doctor, is Mr. Dryden not doing his duty to the Province—is not the Gov-

ernment at Ottawa, and Toronto, and every progressive Government in the land in the line of duty in encouraging that form of education that brings to the farm house, to the kitchen, to the stockyard, to the poultry department—wherever information of that kind is required—the intelligence that will remove the obstacles to success ? That is the watchword of agriculture in this country. It is this that has brought Denmark into prominence in butter and cheese: this that has given Belgium its high standing. We do not achieve success by chance. I do not believe in chance myself. Edison once said that "genius consisted of one per cent. of inspiration and ninety-nine per cent. of perspiration." There is a good deal in that. You must work for what you get on the farm, as I knew in my early days. The farmer must work for every lamb he raises; for every hog he slaughters for the market. The same principle applies to everything. It applies to the politician, and to every man who achieves success. Longfellow said :

"The heights of great men reached and kept,
Were not attained by sudden flight,
But they, while their companions slept,
Were toiling upwards in the night."

We have plenty of room for farmers in Ontario. I should like to see a few thousand more in this Province. Mr. Fisher called this a live stock gathering. It is just the kind of live stock gathering I should like to see in every part of Ontario. We have one hundred and twenty-six million acres of land in Ontario. At first sight one would hardly suppose that Ontario is nearly twice as large as the United Kingdom, judging by the influence that John Bull has exerted over the world. It is larger than the nine North Atlantic States of the American Republic by one-third ; larger than Maine, New Hampshire, Vermont, New York, Pennsylvania and Ohio combined.

You have grown since you came into this meeting, have you not ? Mr. Dryden says this is a growing time—a twentieth century gathering. At the beginning of the twentieth century we are thirty million acres larger than the States I have mentioned. We are afraid sometimes that they will gobble us up. How is it if we occupy all that extent of territory that we have only cultivated thirteen million acres, or a little over one-tenth? What are you doing? What a lot of easy-going people you are. Look at the heritage we have for posterity. Look what dreams we may indulge in as to the future power and influence of Ontario. The United Kingdom half our size with forty-one millions of people. We have not begun to realize our possibilities. Room for the farmer ? I should think there is. Is there a market for him ? England imports about eight hundred million dollars' worth of food stuffs every year, and Canada sends seventy million dollars' worth—less than one-tenth of what she consumes. John Bull has a generous appetite as well as a generous disposition. We send about 70 per cent. of the cheese, far fewer cattle than he requires, a small portion of the flour he needs, and as to the rest of the commodities, he finds them in France, Germany and Russia, and in the United States. There is no danger that with any increase in the farming community the market is going to be seriously affected, so long as Mr. Fisher gives us good transportation and suitable cold storage.

I do not want us to entertain an exaggerated opinion of ourselves, but we should realize our possibilities to do what other peoples have done, and a little more, may be.

Let no Canadian leave this country for any other land on the ground that there is not room enough, or on the ground that there is not a future for him if he applies himself.

Are we not growing in agricultural wealth ? Everyone can answer that for himself. I have driven, in the course of my duties, through almost every county in Ontario in the last few years. Many of these counties I knew thirty years ago. No one who passes up and down our highways and looks at the beautiful houses and fine barns but can see on every hand marks of prosperity. See the farmer out on a holiday—see him at any public gathering—see his family in the churches in the country;

there is every indication of wealth, comfort and refinement, which is a proof of civilization and intelligence. No one will question that the agricultural classes of this country are prospering reasonably well.

You have one thousand million dollars invested in the farms of Ontario. The sum invested in all our manufactures when the census comes out will not be more than two hundred or two hundred and fifty million. Four times as much capital is invested in agriculture as is invested in the manufacturing industries.

Our country is growing. Ten years ago we manufactured nine million dollars' worth of cheese. Last year it was thirteen millions. Our creameries, ten years ago, produced a million pounds of butter. Last year it was nine million. Mr. Mills has referred to our success at the Pan-American. That success is remarkable. We should not lose sight of it. What reward can you as a Canadian—what reward can I as a Canadian—feel like giving to the fruit growers of this Province, who could beat every State in the Union except New York, which only won on the varieties exhibited and not on excellence. We are all interested in the honors you win, no matter where it is. It brings honor and power to Canadians, and your success in times of peace is quite as much to the honor and glory of Canada, although not quite so spectacular, as the success of our sons on the fields of South Africa. It helps to give us the national spirit—to feel that "the life is more than meat," and that our Canadian heritage is more than mere dust and ashes. You are here to improve your own position, and the man who would not wish you "God speed," and help you in that effort, could not be a good Canadian. When you help yourselves, you help us and everybody else.

Dr. Mills said there were all kinds of people gathered here. I heard of an old lady who once said it took "all kinds of people to make a world," but she thanked the Lord she "was not one of them." Everyone who belongs to any profession or calling shares in your prosperity indirectly. Everything you do to improve your position, improves the position of the working girl, and of the man that grinds at the mill, of the mechanic at his lathe, the teacher in the school. You raise the plane of society—the plane of Canada—to a higher, broader level. This is the work of the farmer, and what nobler work could be allotted to any man. You have as your companions good men in all professions. I have heard politicians speaking to a rural constituency who would appeal to farmers as farmers for their support. I never had such a narrow view of politics since I entered political life. What helps the farmer helps everybody ; it contributes to good government. We must all keep step in the great procession of nation-building. You are the most numerous army in that procession, but at the same time you are but one branch of that great army. I am proud to see in that branch so much discipline, so much intelligence and progressive spirit.

I am glad you have such comfortable quarters here ; that you have so much room. I was not sorry to see you squeezed a little ; I was squeezed myself. For one thing I was struck with the calm and the quiet of the ground floor, and in the second place with the noise and confusion upstairs in the poultry section. There were more roosters crowing than I ever heard, even in a general election. One would have thought these birds were celebrating the return of the wicked Grits to power. I am not sorry you were squeezed, because it indicates the wealth of influence that gathers here. Are we going to let you be squeezed next year? Not if I can help it. I was much pleased at the generosity of my friend Mr. Fisher. He is a Scotchman. I will make him a proposition and go half with him. (Laughter.) If I can get my colleague, Mr. Dryden, to recommend it. (Laughter.) I never do anything in the Department of Agriculture unless Mr. Dryden recommends it. I do not do everything he recommends, either.

Hon. Mr. Dryden : Do not tell too many secrets now.

Hon. Mr. Ross : I will, however, go half with Mr. Fisher, and if he will provide one auditorium for the live stock associations in the western end of the building, I will provide another for something else in the eastern end. I think we should have the two. I think you have people enough to attend two lectures held simultaneously. You would thus save time, which is of considerable importance, seeing that you come so far. Any-

way, whether the money comes from Ottawa or from Toronto, I hope no effort will be spared to perfect the plans, so well arranged up to the present, so that any person who wants to hear a lecture on any topic on the programme will not be prevented from doing so, as many were to-day. Many were anxious to get in and could not. Whatever is or is not done, I sincerely trust this Association may continue to prosper. That you will continue to win honors abroad and large profits at home, and that the farmers of this country may enjoy in their families that social happiness that comes from reasonable profit. Prosperity and happiness do not always go together, but "The happiness of the whole people," as John Bright said, "Is the highest duty of statesmanship."

I trust that for all time Canada will hold its place in the front rank, and that progress in the Dominion in the future will be coincident with good order and public morality.

The musical programme was in charge of Capt. T. E. Robson, Ilderton.

DESIRABLE AND UNDESIRABLE POINTS OF A BEEF BULLOCK.

By Prof. Day, Ontario Agricultural College, Guelph.

I know there are two ways of dealing with this subject—one from the butcher's standpoint and the other from the point of view of the breeder and feeder. This afternoon I should like to take up the discussion from the feeder's and breeder's standpoint. Some of these differences we will refer to as we proceed.

In judging an animal, we first look at its general appearance—the general outline. We want an animal as much of a block in appearance as possible; that is to stay, all the lines comparatively straight ; a straight top line and a straight under line, and a straight line behind. No neck worth speaking of, short legs, and a good length of body. That is the ideal steer.

With regard to the steer before you, it is hard to get an animal that nobody can fault. This one has his faults and also his good points. I brought him in because it is easier to point out the location of certain things with an animal before you. This is a right good steer, and rather difficult to fault, although he was beaten in his class. Good depth of barrel is exceedingly important from the feeder's standpoint, but not so important from the butcher's. The butcher does not care whether an animal has any chest at all, as that is a cheap part of the carcass, but the feeder knows that unless an animal has good depth of chest and barrel, he will not have the capacity for utilizing a large quantity of food. In order to get a good top, which is valuable from the butcher's standpoint, we must have good depth, because it can only be obtained by the food the animal consumes and utilizes.

Under the head of quality, we must take into consideration the bone the animal possesses, the absence of roughness in any part, and the tendency to lay on flesh smoothly on all parts—especially on the valuable parts of the carcass. The animal must not become baggy, with lumps and rolls of fat in any place. You want the fat and flesh laid on smoothly and thickly, especially on the important parts, such as loin and rib.

From the feeder's standpoint we like a mellow hide, not too thick nor too thin—a happy medium is desirable. An extremely thin, papery hide is an indication of lack of constitution, while a harsh hide like leather indcates hard feeding qualities.

In regard to the bone, we notice that principally in the legs, and also in the hook bones and shoulder, and to a greater or less extent in the head. The bone, so far as the butcher is concerned, should be fine, the finer the better ; but we know that an animal must have a certain amount of bone to develop a large frame and carcass. Consequently, we like the bone fine, in proportion to the size of the animal. It is possible to go to extremes, but at the same time coarse bone is objectionable, as it indicates a large proportion of bone to meat, and so far as we can we must comply with the demands of the market.

The head of an animal is more or less an indication of its general quality ; it cannot be followed with absolute certainty, but it is an indication. If an animal has a long, coarse head and spiky horns, you will usually find lack of quality throughout. An animal with an extremely short, broad head very often has a tendency to shortness of body. While that type is a good feeder, the butcher would rather have more length. While we want a head that is short from the eye to the muzzle, I think we can go to extremes in this respect. Speaking generally, we may describe the correct head as somewhat short, with the bone fine and clean.

We like to see a moderately broad muzzle, with a good wide mouth and a large open nostril. The mouth is an indication of the digestive organs, and the nostrils indicate the lung power of the animal.

With regard to the eye, I can scarcely explain why it is, but the fact is well noted that a good bright, prominent eye—I do not mean a wild eye—is an indication of an animal that makes good use of its food, while an animal with a sunken eye is lacking in this respect, and has a weak constitution.

A long, narrow head is associated with a narrow body, and a tendency to put on flesh in an undesirable manner—that is, a lack of covering of the valuable parts. You will generally find an objectionable body go with a long, narrow head, particularly if the animal has a small eye. These are the reasons why people attach importance to these parts of an animal, especially in breeding stock, because these animals are to go on reproducing their kind.

The horn is also an indication of quality. The horn should be flat, rather than round. A round, spiky horn is an indication of coarseness. This animal has a good full eye and a reasonably broad muzzle, a nice clean-cut head, and a flat, clean horn. The head of an animal with good feeding qualities should be possessed of these characteristics. But the head, after all, is not the most important part of the animal. One does not spend much time examining the head, but the body, and the general capacity of the animal. At the same time you will usually find a reasonably good head goes along with a thrifty steer. As regards the neck ; the shorter the neck the better, because it is a cheap part of the carcass ; and more than that, a short, thick, compact neck indicates ruggedness of constitution and good feeding qualities.

On the other hand, a neck that is long and scrawny indicates a poor feeder. This animal's neck is good ; it is short, and blends well with the body. There are no great, bare shoulder points. You can hardly tell where the shoulder leaves off and the neck begins.

Since the neck is such cheap meat, one might ask, why not have it as light as possible. Because, if you have an etremely light neck, the animal will lack capacity generally and constitution. You must have a strong, thick neck, but not a long one. A strong neck is associated with a good, broad chest and lung capacity. The shoulder should be smooth and well covered, and should blend well with the neck. When you touch some shoulders there appears to be nothing but bone. There should be something besides the skin. Over the top there should be fairly good width ; but not an open shoulder, where the blade bones stand up above the centre. The shoulder is a cheap part of the carcass, and we like it laid in as smoothly and compactly as possible, not standing up, but perfectly level and well covered over the top.

Coming below the neck we have the front of the animal, including the breast and brisket. The more width in front of the shoulder the better, provided the rest of the body balances properly. This gives capacity to the heart and lungs, or the vital organs, which play an important part in keeping up the strength of the animal. We therefore want a good broad front. Some people attach a great deal of importance to the brisket. So long as it is plump and of good width, it is all we need. It makes very little difference whether it extends forward an inch or so more or less ; it merely adds to the appearance of the animal. What you want is enough to indicate a good width of chest behind, indicating good constitution. A great flabby, hanging brisket is objectionable, as it of no value "from a consumer's standpoint. This steer stands

with his legs well apart in front, has a good plump brisket, and good width across the front of the chest. The shorter the leg, the better. This animal might stand lower, but he is not leggy. The leg is of no market value, and the less leg the better, provided other things are equal; but as a rule you will not find the shortest legs with a good length of body. Now, as to heart girth, the filling of the fore-flank is important, and in looking at an animal in high condition, you must take care that you are not misled by a lot of loose, flabby fat there. Sometimes animals that look extremely full there when in high condition are exactly the reverse when in lower condition. The reason we want fullness there is that it indicates heart capacity, or a good wide cavity to hold the heart. An animal should have great thickness back of the shoulders, giving large capacity for heart and lungs.

An animal should be well covered with flesh along the top of the back. This is the region of the rib roast, and is a very valuable part of the carcass. You want thickness there, together with smoothness. You do not want to strike the bone when you handle a steer along the top of the back. Taking the barrel as a whole, the greater thickness we have, the better, and the greater smoothness, the better, and from the feeder's standpoint, the greater depth, the better. The butcher wants all the length he can get, but the feeder knows that extreme length means weakness. The ribs should be well sprung, giving large capacity. I have seen deeper steers than this one, but one of his virtues is his extreme firmness. There is not a bit of paunchiness; he is firm, yet mellow and well covered, and there are no hard rolls of fat on any part.

The loin is perhaps the highest priced cut in most markets. This is where the porter-house steak comes from; and the more loin we have, the better. I prefer a loin that rises just a little bit full—not arched, but one that is just a shade full. I have watched this point in swine and sheep, and where there is a sag in the loin, the animal is almost invariably thick in fat and thin in flesh. In judging breeding stock, I always like to see an animal that has a straight, strong back, and a strong, full loin.

The hook-points are of no value from a butcher's standpoint. If wide apart they indicate that the carcass will have width and scale. Unless there is width here, an animal will not have good width in the loin or sirloin; but we do not want an inch more width across the hooks than is necessary. Consequently, we like the hook-points smoothed off roundly; not standing up but covered well, and showing no tendency to bareness. This will indicate that the animal has a large proportion of flesh to bone.

The pin bones (located each side of the tail-head) should have fair width, but we do not want prominence to these parts. As a rule, an animal that is smooth over the hook-points will tend to be smooth here also. Many animals show patchiness at this point, and many old cows develop bunchess of fat here. We can overlook it in an old, breeding cow, but not in a young animal. Lack of smoothness there is an indication that an animal will form too much fat, and also lack quality. With regard to the rear of the animal, the deeper it is at the junction of the thighs, the better. This animal is not perfect here. He cuts up a little too high. The lower and the fuller he is at this point the better. He should be well packed with flesh between the thighs, and the flesh should be carried as near to the hock as possible.

In regard to handling; there is a difference between fat and flesh, but it takes an expert to tell the difference. We do not like our fingers to touch upon bone when we handle an animal. There is a difference between firmness and hardness, and between mellowness and softness, but it is impossible to put the difference into words. An animal should be firm without being hard, and mellow without being soft. We like to feel a uniformity in the quality of the flesh, no matter where we touch it. One of the common places for a fat animal to go off in quality is right over the back rib. Many animals will form a hard roll of fat there if carried too long. You would not want to eat that roast when the animal is in that condition.

Another indication of an animal being too far on is that you will find hard and soft spots. It should be uniform in all parts. From a feeder's standpoint the hair should be abundant, but it should be fine, and soft and furry in character. So long as it is of that character, it cannot be too long; but if it is coarse and wiry it is very

objectionable. I have heard people find fault because the hair was long. You cannot have too much hair, provided it is fine. Why that is so it is hard to explain. But the heart is furthest from the hair, and in order to have hair of good quality it must be well supplied with blood. This indicates a good heart and good circulation, which means a good constitution, and good feeding qualities. This is said to be the reason, and you can take it for what it is worth.

Question: Is not a falling away at the base of the rump the chief failing in many animals?

Answer: Yes, it is; but it is not nearly so important as the top.

HOW TO SELECT AND BREED A BEEF BULLOCK.

By Hon. John Dryden, Minister of Agriculture.

In reference to the selection of animals from which to make the class of beef represented in the animal we see before us, there are two modes of procedure for the ordinary farmer. The first is for him to breed the animals himself; and the second is to buy them and feed them. The second plan is, in my judgment, the ideal one, provided he can find at hand a sufficient number of animals from which to make a selection. The difficulty feeders experience is that they cannot find suitable animals in sufficient numbers to meet their requirements. I may say that the selection must be made from beef crosses. If a selection is made from any of the dairy crosses, the quality of the beef will be inferior, and the cost per pound will be altogether too great. You must have an animal that will convert food into beef as rapidly as possible, and as economically as possible. For hundreds of years the beef breeds have been bred with this end in view. It is the same with the dairy breeds; there you have a machine for converting food into milk. Do not say that a dairy cross is just as good, because it is not. In the quotations of the leading stock markets you will often see what are termed "off color" steers referred to. What difference does the color make? No difference. This term is used in referring to animals that are largely dairy crosses. They do not want anything of that breed or quality.

Having decided as to that point, the next question that comes up is, At what age should the animals be purchased? For my own part, I prefer to buy them when young, perhaps less than a year old; not more; for the reason that I then have them under my control. A man will often allow his calves to get stunted and out of health, and then sell them to me to feed, thinking that I shall not lose anything in the process. But I cannot make a reasonable profit out of animals of that kind. If the plan of breeding his own stock is followed, the feeder will need to have three lots of animals on hand at the same time: calves, yearlings and two year olds. Unless he has an extensive farm, he will not want to do that; so that most men trust to being able to purchase animals at an age to suit their purpose. Supposing you follow this plan, how are you to tell an animal that will be profitable to feed? You will not have a finished animal presented to you; you must form your judgment from an animal in the raw state. There are some points that are essential in a good feeding steer, and these Prof. Day has covered pretty well. Let me illustrate by something entirely different. Supposing you were going to plant a maple tree. How would you proceed? Would you select a scraggy, crooked, undeveloped sapling? No; you would want a straight, strong, vigorous growing sapling. The same principle holds good in selecting a calf out of which to make a finished steer. You do not want a narrow, sickly, weakling, but one answering to the description that Prof. Day has given. A good feeder is always a wide-chested, broad-backed, low-flanked animal. These things go together. Do not buy a long-legged, narrow-chested lanky steer that looks big; he will never come to anything. He will waste your money, your feed and your time. Select something along the lines Prof. Day has pointed out. You can tell that he is wide in the chest, that

his ribs are well sprung, and that he is deep in the body. All these things you can see as a calf. Some people think a steer is a steer, and that it does not make any difference. That is where they lose their money. Get these underlying principles into your minds and you can easily work it out for yourselves. The surest way I know of for young men to learn this business is to invest their money in three or four steers of different quality. The result of your feeding will teach you, as nothing else can. It will cost you more money than these lectures, but you will never forget the lesson. We have passed away from the old idea that any fool can follow successfully this business. We know that the breeder and feeder is a manufacturer of the highest character, and must know every detail of his business.

Never discard a steer with a good coat of hair. It indicates that he has perfect health and can stand all kinds of weather. I like a steer that has a good carriage—carries himself like a gentleman—walks with his head up and stands straight on his legs. I do not like one with his head away down, sneaking around. He will be a good deal like a man that does that. I do not like that kind of a man either. (Laughter.) The better he stands on his legs, the more weight you can put on him, without incurring the danger of crippling and breaking down.

If you are going to breed these animals yourself, then you will enter on an entirely different problem, and there must be a good deal more thought put into the business. To produce the right kind of steer, some one will ask the question, must we use pure-bred females? They are not at all necessary. In a general way, I would prefer a rather strong, well-made cow, with a good udder, but not necessarily pure bred. One of the best steers I ever sent to market was from one of the poorest looking cows we ever had, but a good milker. It belonged to one of my men. She produced a steer exactly like the bull. You do not need the better kind of females if you cannot get them; but the better the females the more certain are you of the result. You must have a superior sire. I have pure-breds at home, and you may think I am advertising them. I am not. I used to grow steers like the rest of you, and was at it for many years. In those days I would rather give $300 for a superior sire that suited me than $75 for one that did not. Do not buy a bull merely because it is low priced, even for producing steers. It is a great mistake. The difference on 25 calves may easily be $10 per head, or $250, when you have the steers finished, which is the difference in price in one year's crop of calves. I do not mean that you are bound to get a good bull if you pay $300 for it. That is where your brains come in. That is where your judgment and this education comes in. That is why we want to educate the farmers to know what they require. I am always delighted when I go to England or Scotland to observe that the farmers there have an opinion of their own. When they go to a sale, one man wants one animal, and another wants something quite different. He does not care what another man buys or does not buy; he buys what his judgment tells him will meet his requirements. These men have found from actual experience exactly how to go to work. At a sale in this country, if the bidding on an animal happens to start at a low figure, nobody wants it. The man who had thought of purchasing it, at once says to himself: "Hello! nobody wants that animal;" and then he does not want it either. Form your own conclusions. Get knowledge enough to form your own judgment; do not mind me. Think it out for yourselves, and then you will work out your own problems correctly. If you do that you will force the breeder to give you the animal you require. It costs no more to care for one of these better animals, and not as much for feed. See how easy it is to make one pay where the other will not.

When you select a male animal, get what I call a prepotent sire—one that will impress his essential qualities on the calf you are going to feed. You ask, "How am I to tell I am getting that? By examining the pedigree. But what is the use of nine-tenths of the farmers examining the pedigree? It is of no use. You see that the animal is registered and pure bred, and that settles it as far as you are concerned. You know nothing about the quality of the animals in the body of the pedigree, and it is this that makes a good or a bad pedigree. When a breeder breeds for certain definite characteristics for a long period of time, his animals become so stamped with

those characteristics that they have the unfailing power of transmitting them to their offspring. That is what is meant by prepotency. That is the kind of bull you should have—one that has the right characteristics and the power to transmit them to the greatest degree possible.

If you get a deep, broad, thick calf, with plenty of hair, good carriage and standing on short, straight legs, go at it; you are all right. If you can get lots of them, you will not need to breed them.

What about color? Does it matter? I would not care if I were feeding steers. I would take an animal spotted all over if it were superior, in preference to a solid red beast that was inferior, every time. It is possible to have a superior animal with the horns a little off in shape or length. It is not essential that the horns should have exactly the correct angle. You can cut them off anyway. (Laughter.) Even if the animal's leg is a little crooked, I would not mind it very much. The main thing is to study the essential qualities. Make your selection along those lines and you are bound to succeed.

CALF RAISING.

By A. W. Smith, Maple Lodge, Ont.

Mr. Dryden has spoken of the necessity of having animals of the correct type for feeding, if they are to return you a profit for your outlay and labor. He pointed out the necessity of certain lines of breeding. Not only is this essential, but you must have the product of that breeding right before you proceed.

I should like to say a few words on raising the calf. Almost all the steers in this country that are classed as first-class export steers are raised by the farmers. In nearly all cases they are raised largely on skim milk. It is a very easy matter, but altogether too expensive to allow a cow to raise a calf, and in that way get a nice plump calf. We find it necessary, however, to make use of the cream, and feed only the skim milk. But we can interfere with nature only to a certain extent. For the first few weeks in the life of the calf we have not found it possible to supply anything cheaper than the whole milk. We get the best results by allowing the young calf to have pure milk direct from the cow. After three or four weeks you can feed skim milk, using ground flax seed as a substitute for the cream in the milk. This is made into a tea or warmed until it forms a jelly. A calf fed in this way will equal in condition a calf fed on whole milk, and at a much cheaper rate. In either case you will have to give a certain amount of grain or some concentrated food in addition to the flax seed. Our experience has been that ground oats form the best food for this purpose, although some claim that whole oats are better. No other grain will give the same results in producing bone and muscle and growth of body.

Question: Mr. Dryden spoke emphatically of having the quality of prepotency in the sire. He also stated very truthfully that the majority do not understand pedigrees. I should like to ask him what we are to look for in the sire outside of the pedigree to show that an animal is a prepotent sire?

Hon. Mr. Dryden: What I mean by a prepotent sire is one whose ancestry has for generations been breed along a definite line. The pedigrees of some of our pure bred animals have been cris-crossed, one strain with another. For instance, there is a difference between a Scotch or Cruickshank Shorthorn pedigree and an English Shorthorn pedigree. Mr. Cruickshank started to breed animals that would mature at an early age. The old idea was that maturity should come at four or five years. He succeeded in producing an animal that you could force to a wonderful size and quality in a short time. The other you cannot. The English type was lengthy and tended to produce tallow rather than flesh. The Scotch idea was to produce flesh against too much fat. When the blood of these or other strains is intermingled the animal no

longer remains true to type. The more mixed the pedigree, the less potent will the animal be to produce others with definite and unvarying characteristics. The reverse of this is prepotency, and the longer animals have been bred with a definite object in view, the more prepotent will they be. But I do not care what the pedigree is like if the animal does not correspond. To understand pedigrees properly it is necessary to be thoroughly acquainted with the history of the breed.

Question : How much flax seed do you use in feeding calves ?

Mr. Smith : We find that is a matter that has to be judged. Some calves will stand more than others. Some can be given a tablespoonful to begin with, at, say, four weeks old, increasing it to twice that amount in two or three weeks. Sometimes we continue the smaller quantity for two or three weeks, according to how the calf is thriving.

Question : Is it fed raw or cooked ?

Answer : It is always cooked. We grind it and pour boiling water on it and let it stand.

Hon. Mr. Dryden : A good substitute for flax seed is porridge. We use cracked wheat at home. It makes a good sort of porridge, and the calves like it too. Start with a small quantity of that in the milk, and they will soon get fond of it. It has salt in it, and it is cooked well. If it is half-cooked you will have trouble with your calves; but I have never had any trouble when it is cooked just as we demand that it shall be for our own breakfast. Take the scrapings of the pot, or, if necessary, make it on purpose.

Question : The best substitute for milk I ever had was to take the best white bread and crumble it into the milk.

Mr. A. C. Phelps, Beamsville : We give the calves new milk for the first two weeks ; then skim milk and porridge, as suggested—about a saucerful till they are five weeks old. Then they run on grass, and during the winter are fed silage and clover hay. I sell them at 14 months, and they net me $36.40.

Question : Does it pay best to sell at 14 months or keep an animal a year or a year and a half longer ? Is it more profitable to buy good grade yearlings to turn out at two years, or to buy them older and turn out at three years ?

Mr. Simmons : A calf, raised as stated, should weigh ten hundred pounds at 14 months, and should bring more than that price.

Question : To produce a good exporter, is it necessary to feed meal from the time it is a calf till it is ready to ship? There is a time when the farmers do not feed meal. We are behind the Americans in this respect. They feed meal or corn till the animal is shipped to the Old Country.

Hon. Mr. Dryden : Our farmers are not a bit behind. That is a very important subject. I told you here last year that I would not cease my efforts till our farmers had the same chance to make money in raising beef as they have in the United States. If you will bring me an exporter or butcher who will guarantee to give six cents per pound for all animals of a certain standard, I will find lots of people to go into the business of raising a superior beef animal. The trouble is that they will not give the price. The conditions in Chicago are different. There they can use every part of the animal. They make their profit out of the by-products—the hair, the hoofs, the horns, the blood, etc. We must get there somehow in this country or we shall be behind. It is not the fault of the farmer. We have skill and pluck enough and know how to do it ; but if we cannot get the money, they will beat us.

Question : Can we not ?

Hon. Mr. Dryden : That is what we have not yet found out. We are 500 miles nearer the British market. I have talked to the agent of the Chicago Stock Yards, who says that our grain-fed cattle will ship better than theirs.

Question : Is it a fact that American cattle bring a better price in the Old Country market than Canadian ?

Hon. Mr. Dryden : I do not think they do.

Mr. Maher: A shipper told me that Canadian cattle of as good quality as American cattle bring as good a price in Liverpool.

Mr. Dryden: Then what is the matter with us; tell us that?

Mr. Maher: The trouble is that it is a difficult matter to get many export cattle in one place. The business is not centralized the same as in Chicago.

Hon. Mr. Dryden: Then we must get it centralized. They are starting a new stock yard in Toronto, and I hope it will be extended enough so that we can get these great shipments, so that someone will be able to pay the prices. We can produce animals just as good as they can.

Mr. Maher: The freight is a very important factor. If we can say we have a thousand carloads of export cattle, we can get a much better rate than for one car. That is where Chicago gets the better price.

Mr. Simmons: I think that Mr. Gould has bought a number of cattle at close on seven cents per pound on the show ground to-day, which is quite equal to Chicago cattle. If we get the quality we can get the price.

Hon. Mr. Dryden: He is an American buyer.

Mr. Simmons: He is a Canadian-bred man.

Hon. Mr. Dryden: I know; he comes from South Ontario, where all the rest of the good things come from. (Laughter.)

Question: If we had the machinery for using up the offal, I think we should be able to compete.

Hon. Mr. Dryden: If it be true that Canadian cattle sell better according to quality than the American, some one must be found to give us the money. Who will start first? Will the buyer say, we will give 5 1-2c or 6c per pound all through next year and the year after? If so, I will guarantee that the cattle will be produced. I can name a dozen men in my county who will go into the business; but they will not go into it at four and four and a half cents. The drovers say it does not matter about the quality; we can only go so far. Consequently men get disgusted and say it is of no use our finishing our animals if they will not give any more for a finished animal. It is all a matter of dollars and cents.

Question: What is the most desirable weight to have shipping cattle?

Mr. Simmons: Thirteen and a half to fourteen and a half.

Question: How is it the heaviest steers always sell highest.

Answer: They do not.

Question: Is it necessary to follow up a little meal in order to finish a beast properly when he is a yearling and a two year old? I find it necessary.

Mr. Smith: You must keep an animal going as rapidly as possible. If you allow an animal to stop, he does so at a loss, and if he goes back the loss is greater still.

Mr. Simmons: We invariably lose money on heavy cattle. They are all right at home for show cattle; but for a man to put his money into them to send them to England, it will break him up.

Hon. Mr. Dryden: The cattle that sell best there is the moderate sized, fleshy, well finished article.

Mr. Simmons: Something similar to what Mr. Gould awarded first prize to. They are full of flesh; not tallow. It is no use to put $25 into a bullock full of tallow; it is a clean loss.

Question: I canot get my calves to eat chop during the latter part of May and early in June, when they are on the grass, although I keep them in box stalls at night.

Mr. Smith: I think the difficulty is in the manner of feeding. If you use the greatest care and attention in feeding, you will be able to get them to eat a small quantity, but not so much as at other times. We never find the difficulty you speak of.

Question: I notice that chop scours them somewhat when they are on grass.

Answer: Then feed oatmeal with a little bran, but no strong meal.

Hon. Mr. Dryden: The kind of grass would make a difference.

Mr. Monteith: I think there is some confusion here; one gentleman is referring to calves and the other to finished cattle.

Question : Has anyone tried keeping the calves altogether on grass ?

Mr. Monteith : I think that is an important question. We feed largely, but we also raise a few calves each year. We have always fed them meal, and have never had any trouble. We used to keep them in altogether, but we found that if we did not give them a little grass the first summer, they often went back the second season. We found out the advantage of turning them out at nights the first season, and they got into the habit of grazing, and the second season they did not require much meal.

Quesion : Do you feed whole or ground oats ?

Answer : We get better results by feeding whole oats and bran, as it keeps the box clean.

Question : How much milk do you give your calves when you take them from the cows ?

Mr. Smith : A very small quantity or they will get indigestion. Give a young calf a quart to start with at a feed and increase it gradually.

Mr. Anderson : It has been our experience that a calf coming in November is quite as well grown at two and one-half years as the calf coming in April and May is at three years old.

Mr. Smith : I think that point is very well taken. The reason I give for that is the calf that comes in the fall is housed during the winter and gets better attention from the man in charge of the stock than the calf born in the spring, when the man is employed in other ways, and the easiest way of feeding the calf is to let it out and let it go. It is better fed in the winter.

Question : Give us a ration for feeding cattle ?

Mr. McMillan : That is an important question, and I may answer it in this way. The majority of those here are interested in Farmers' Institutes. I hope that before coming to this meeting they perused the various reports they received as members of these Institutes. There is very valuable information in these reports. In the last report of the Agricultural College I find a summary of the experiments conducted by Professor Day in different feeding rations. These extend over a number of years. We find from the results of the experiments at the college that better gains are obtained, considering the value of the feed, from feeding small quantities of meal than from feeding too much. That bears out our own experience. In answering this question further, I will give our own feeding ration. I have fifty steers, two years old, and averaging a little better than twelve hundred at snowfall. We shall finish them at the beginning of July, when they will be about fifteen hundred. We may be a trifle on the heavy side. We feed ensilage, a little cut straw, and a little grain ration—a mixture of bran and shorts, and we grow oats, barley, and goose wheat together and mix these grains, feeding 2 1-2 pounds per bullock, and increasing that to 3 1-2 or 4 pounds in the spring. We do not get the highest gain carrying them over winter, but they strike the grass at the right time and gain almost as much on the grass as they gain over winter. We have a few we are finishing for the end of March, and we feed them about eight pounds of meal.

Question : Do you give any roots ?

Answer : We give no roots to our fattening animals.

Prof. Day : I am glad Mr. McMillan touched on the point of feeding silage. Many people believe it is of no use for fattening animals. We commenced a series of experiments along that line last year. From these experiments we found that the dry matter of silage proved equally as valuable as the dry matter in roots in feeding steers. We found that 100 pounds of silage contained 20 pounds of dry matter, while 100 pounds of roots contained about ten pounds, or only half as much.

I do not by any means wish to under-rate the value of roots. They fill an important part in our feeding operations, and I should be sorry to see them omitted—more especially for breeding stock and young animals. They are easily digested and have a beneficial influence in keeping the animals healthy and the bowels regular. Silage is just as valuable as roots for fattening. We can produce the dry matter in silage at one-third of the cost of the dry matter in roots.

Question : What about dry shocked corn in comparison with silage ?

Prof. Day: I prefer the silage for the reason that it is succulent and has a beneficial effect. Our experiments have been rather favorable to silage, still the dry corn fodder has a considerable feeding value. Certainly the silo is a very convenient way of storing the corn.

Question: How much silage would you feed by bulk per day?

Answer: Thirty to thirty-five pounds.

Question: How much roots?

Answer: That would depend on the supply. We seldom feed more than 30 pounds to 35 pounds.

Mr. Monteith: While making the idea prominent that there is a place on every farm for the growing of roots, yet you would not by any means wish to leave the impression that silage is not a very good feed for young stock?

Prof. Day: I do not think that silage will hurt any kind of stock.

Question: Do you feed meal in finishing your cattle on the grass?

Mr. McMillan: We always find good results from feeding meal when the cattle are on the grass, but we are not doing it at present. Formerly we were not so careful in getting them out in an even condition, and we fed meal to the backward ones. We had the largest gains per day when feeding meal on the grass that we ever had under any system of feeding.

THE KIND OF CARCASSES REQUIRED TO BRING THE HIGHEST PRICE IN THE BEST MARKETS.

By Prof. G. E. Day, Agricultural College, Guelph

I do not profess to be an expert on dressed carcasses. We had arranged to have an expert here from Chicago, but unfortunately, he has disappointed us at the last moment, and I have been asked to take his place. I am not going into a discussion as to the merits of the carcasses presented to illustrate this lecture—that is for the judges to decide—but I will try to indicate the relative value of the different parts of the dressed carcasses.

When I was at Swift's packing house in Chicago last week I made an effort to get the prices of the different cuts, but unfortunately they were too busy to give it to me, and although they promised to send it later, it is not yet to hand, so that I have to fall back on some information that is three or four years old, but at the same time, it illustrates pretty well the points I wish to bring out.

The tapes stretched across this carcass indicate the Chicago dealers' methods of cutting up a side of beef. I have marked the loin cut as being worth 19 cents per pound, the rib roast, directly in front of this, at 16 1-4c, the chuck, or top of the shoulder, at 5c, the lower part of the fore leg at 2 1-4c, the lower part of the side, directly under the rib roast, at 3 1-4c, the part of the side under the loin at 2c, and the round steak, or flank and hip, at 6c per pound. These prices depend somewhat on circumstances, and the variations during the year are somewhat extreme.

When we had the live steer here, I mentioned the importance of having a good top to an animal. This will show why it is necessary, and it is because of the high price of that portion of the carcass.

In looking at a beef animal, unless it is thick in the twist or flank where the round steak comes from, some people form the idea that the animal is of no use. Still, that part is comparatively cheap as compared with the loin and the rib. In the local markets there is not the same discrimination between the round, the loin and the rib; there is probably not more than two or three cents per pound difference. But in the larger cities of the United States, and in the old country, there is a very great difference. Since we are aiming to produce beef for the larger markets rather than the local markets, it is specially important that a good beef animal should have

a good loin, and good rib and a good back. The back must be well covered, but the loin and the rib are of more importance in the best market than the round, so that an animal may be somewhat deficient in the round or in the twist and still have a splendid carcass from a butchers' standpoint.

The flank is very cheap; so is the plate. The butcher would like an animal without either, but the breeder and feeder knows he must have these things in order to get the animal. While an animal must have good depth of chest to give constitution and ability to stand forcing, and a good depth of flank to correspond with a good depth of rib, we do not at the same time want to run to extremes in these things.

When we had the live steer here I said that it was unnecessary to have a great, flabby brisket. When you find an animal with the brisket standing away cut, which flaps up and down when you touch it, it is a weak point, because it gives great weight to that part of the carcass that produces very cheap meat. We must not be misled by the appearance of great depth and breadth here.

We want the loin as broad as possible; not covered with blubbery fat, like so much jelly, which shows surface fat, which is of little use; it should be comparatively firm. There should be a mellowness about it without being soft, and a firmness and elasticity which is characteristic of the well-finished animal. The same of the rib. Here is one of the commonest defects in fat animals. You will often find a roll of fat on the back rib. This is surface fat, which is of no use. We like an animal well covered there, but without the great ridges of fat that we frequently find. Firmness and evenness of handling over the rib and over the back indicates that when the skin is taken off the animal will be found smoothly covered without any tendency to rolls or ridges of fat.

Q: At what point should the side be cut in two? Some claim there should be no ribs on the hind quarter; others say there should be two?

A.: It is a matter of custom; in the Chicago wholesale trade they cut next to the short rib.

Mr. Simpson Rennie: In Toronto it is the general custom to leave three ribs on the hind quarter. There is then more weight to the hind quarter, which is worth more.

Q.: When you sell an animal to the majority of butchers they will cut it so as to leave no ribs on the hind quarter, and tell you that is the custom in the cities.

By H. A. Foulds, Butcher, Brantford.

Speaking from a butcher's standpoint we of course want the cuts that will bring the most money. There is an old proverb in our business that while anybody can sell good cuts, it takes a good salesman to sell poor ones. All our customers want hind quarter, and anything under that names goes. I have sold thousands of cuts from the hind quarter when cheaper cuts from the chuck, near the top of the shoulder, would have given customers as good or better meat at a lower price. There must of course be some rough meat on a carcass, but it should be the aim of the breeder and feeder to produce as much meat as possible where the public demand it. I will try to point out from this carcass what is wanted.

The question is sometimes asked, How do you get rid of the rough meat? The answer is, we have generally a customer for every piece of meat according to what they can afford to give. In the local market, as Prof. Day has said, there is not such a wide difference in the prices of the several cuts as there is in the Chicago market. With us in Brantford that part of the side below the loin would sell at about 6c per pound. Sirloin steak, taken from the back just in front of the round, would bring 15c, and the porterhouse steak taken from the loin just in front of the sirloin is three or four cents more. Personally, although I admit there is a small portion of the porterhouse that is very good, I do not think there is the difference that some people imagine. Still, people are ready to pay the difference to get what they

want, and it is our business to cater to the public taste. The short cut, at the top of the thick rib, is, I believe, equal in value to the porterhouse.

The customer in every country must have lean meat predominating over the fat. No doubt the man who got second prize was very much disappointed because we have given the first prize to an animal which when alive was decidedly inferior, but which when dead presented a carcass more of the description we want. We do not want an animal too fat for our trade. The carcass to which we have awarded first prize is the most profitable carcass to cut up. This is the one that is good for the butcher and good for the buyer.

Q.: What is the comparative value between the side you marked "first" and the one you consider as overdone ?

A.: If a wholesale butcher brought the two sides to me, I would select the one marked "first" and refuse the other altogether.

Q.: Why is it that fat animals will bring from ten to thirteen cents per pound live weight in this building when the first prize carcass will bring only 7c or 8c ?

A.: The animal that sold for ten cents is simply to hang up for exhibition—just as an advertisement to show what feeding will do. The man who bought it cannot get his money back.

Q.: Who will buy that animal in the shop ? The poor man or the man with the long purse ?

A.: I think it is likely to go to the poor man as a matter of charity, because it will not be wanted by the people who can pay the highest price.

Mr. W. R. Stewart, McLeod, Alberta : As the representative of Alberta, from whence we expect to ship a car load of export cattle next year to this city, I should not like to come all this distance and not know from what standpoint the cattle are to be judged. I see three carcasses of beef. One I call an excellent carcass; another is as poor as I have seen in a long time on exhibition as a fat animal; the third is a carcass that we used to call A1 for Christmas show in this town. Now what have our people to expect from the judges when they come here ? What are they to raise and feed ?

Mr. Smith : I should like to say that this is the question we have laid out for our Association to determine. We are endeavoring to get at that very point. At Chicago the animal that was awarded the first prize alive was not considered when dead the best animal for export. At that show they settled it in this way, that, in making a decision as to the best carcass of beef, you must judge it from the standpoint of the market that will pay the highest price. You can therefore compete in the live class with a much fatter animal than one that you would select for the general market.

Mr. Stewart : Do not you think it is the export trade the people of Canada have to look to, not home consumption ? The animal that has been awarded first prize in the carcass would be altogether too thin for export to Great Britain, and it is to the British market we must look for the principal outlet for our best cattle. That first prize carcass came from an animal that was long and lean when alive, and it has killed out the same.

A member : Yes; it is blue.

Mr. Stewart: I am a purchaser in Alberta of export cattle for Gordon & Ironside, the biggest shippers from the west. If I bought animals like that one I should soon be told that my services were no longer required. I have been asked to represent Alberta by the Government, and I shall be asked to select the cattle that are to come here for exhibition next year. That is the reason I want to know what we should bring, and on what basis they will be judged.

Mr. Campbell : What about the rule in our prize list that all animals except for dairy purposes are to be judged from the breeders' and consumers' standpoint. Have the judges of the carcasses considered the breeder or have they judged altogether from the home trade standpoint ? Were the judges instructed to consider the breeders' standpoint at all ?

Mr. Smith : Certainly; yes. I am not able to answer that question as I should wish, but one of the judges is here and he will no doubt be able to answer it.

Mr. Horace Waller, butcher, Toronto: If Mr. Stewart were in the old country market, he would find this first prize carcass more marketable than any other.

Mr. Stewart : In what shape would that carcass land in England either in cold storage or shipped alive ? It is not what an animal is here, but how it will arrive.

Mr. Waller : The butchers in the Old Country are looking for cattle that they can get their money out of. I maintain there is no waste to that bullock. I consider it a good butcher's bullock. These fat carcasses are not wanted in the Old County markets.

Mr. Lloyd Jones: I had the pleasure of being in England last winter and saw 200 head of Herefords sold on the London market. They averaged 1,400 They brought from £20 to £30 each. I say that animals such as the first prize do not bring within two cents per pound of the fatter one. I challenge you to cut up the two carcasses and show that there is much waste meat in comparison with the lean carcass. You are looking entirely at the home consumption.

Mr. Waller : We are judging the animals that are most suitable for the butcher and consumer. We want early maturers that will not produce too much fat. When you get a bullock to a certain point, you are only wasting feed. At 1,200 they are heavy enough for anybody. Sell them when they are ready. None of the London butchers are looking for cattle that weigh more than 800 pounds dressed.

Mr. Simpson Rennie : Speaking as a feeder, how is it that to-day and for years past the cry has been that you could not make animals too fat for the export trade ? We could make a good deal more money by turning our cattle off when they are comparatively thin, if we could get the same price, but we cannot.

Mr. Campbell : It is evident to everyone in this room that the feeder and the breeder have been entirely lost sight of in the decisions that have been arrived at both in the beef and in the mutton carcasses.

Mr. Waller : I think as time goes on the gentlemen will see that what has been done this year will be done next year and the year after.

A Member : Then you might as well close up the show.

Mr. Campbell : Then it is a lean stock show, not a fat stock show ?

A Member: It is the money we are after, and the animals that will take the prizes are the ones we are going to bring here. How are we to put the two classes together—the live and the dead.

Q.: Do believe the three steers that got first for export would kill out like the first prize carcass ?

Mr. Waller : No, they would kill a better carcass.

Q.: They would be fatter, would they not ?

Mr. Waller: Yes; fatter.

Q.: And therefore better. (Laughter.)

Mr. Duncan Anderson : I think this meeting is hardly dealing fairly with the butchers. They are here to give us instruction. I believe they judged the best carcass for their purpose. The question seems to be, are we to let go the fat bullock as we let go the fat hog ?

Prof. Day : I believe, Mr. Waller, you intimated that you would like to see a carcass a little better finished than the first prize one. It is not an ideal carcass, but it is better than the very fat one. Is not that what you mean to convey ?

Mr. Waller : That is the position.

Mr. Tyson : The animal that will bring the highest price in the Old Country market is the good fleshy steer weighing from 1,200 to 1,400 pounds. They should have any amount of flesh, but not too much fat. A good many people have the impression that the heaviest carcass is the best to sent to the Old Country. The buyers naturally buy heavy cattle for the reason that they can send an 1,800 pounds bullock to the Old Country for the same price as a 1,200 pound one. The man who sends two 1,800

pound cattle sends them for the same price that it would cost to send three of the others.

My opinion has always been that at a Christmas Fair you should give the prize to the fattest animal, other things being equal, and that the carcass should be judged on the same basis. But if you tried to produce cattle like the fat animal here every day in the year you would be in the poor house. That kind of animal is all right at Christmas time.

Mr. Smith Surely you are not educating the people to produce beef for the Christmas market?

Q.: Is it not exactly the same with beef and mutton as with the bacon hog—the consumer wants lean meat?

Mr. Tyson: That is correct; the fat meat is not for trade purposes.

Mr. Duncan Anderson: Are we to understand that the animal that got the first prize is for show purposes—that you buy them for advertising, although for commercial purposes you prefer a carcass like the first prize carcass?

A.: That is correct. You cannot get an animal too fleshy, but you can get it too fat. It was stated here last year that we should educate the people to eat fat beef. You have to start at the other end and teach the farmers to produce what the people want.

Mr. Smith: It is absurd then to give prizes for animals that are suitable only for the Christmas trade? We should give prizes for beef that is useful for 365 days in the year

Mr. Tyson: But I am not making the prize list.

Mr. Henry Glendinning: We have taken the right course with regard to bacon hogs, and we should take the same course in the matter of beef. Of what service is this show if we are to set up standards that apply to the Christmas trade only? Beef cattle should be judged by the standard that applies to the every day trade of the year.

Mr. W. S. Fraser: We are going over the same ground now that we have already gone over in the case of the bacon hog. When I first attended the fat stock show ten years ago the hogs that got first prize were so fat that they could hardly walk into the ring. The same conditions appear to apply to cattle now. In five years hence we shall be in the same position with regard to cattle as we are now in regard to hogs—the well-fleshed animal with a predominance of lean meat will take the prizes in cattle as well as in hogs.

Q.: You would rather have a carcass with less bone and more flesh?

A.: That is right. The other is too fat, you could not eat it.

Prof. Day: He wants something between the two.

Q.: The sheep and hogs that got the first prize and the sweepstakes here and in Chicago got nothing in the carcass; why is that?

Mr. Stewart: At the banquet last night, I saw Mr. Leask presented with two beautiful cups. What were they for? Last year we shipped 45,000 head of cattle from the Territories, and we never shipped one to England of as poor a quality as the first prize carcass. We must have fat animals because we have to ship our cattle 3,000 miles by rail, in addition to the ocean voyage, before reaching the English market, and the shrinkage is very heavy.

Mr Duncan Anderson: I think an effort should be made next year to secure an old country buyer to attend the show. We should be able in this way to obtain a definite statement as to just what the old country market calls for in our cattle.

THE DESIRABLE AND UNDESIRABLE POINTS OF A DAIRY COW.

By Prof H. H. Dean, Ontario Agricultural College, Guelph.

We have a cow before us in connection with which I shall try to point out the desirable and undesirable points of a dairy cow. It is much more difficult to point out the indications of a good dairy cow than it is to point out the indications of a good beef bullock. The reason for this is that the making of milk is a mystery; one of the greatest mysteries of nature; and there is no outward, infallible sign of a cow's ability to produce milk. There are many men who claim to know such a sign, but I confess at the outset that I have never yet been able to discover one that can be relied upon in all cases.

With regard to the cow before us, we reared her and I know precisely what she can do. I chose her because she combines many desirable and undesirable points.

In order to make this lecture as simple as possible I shall commence at the front of the animal and go back, pointing out briefly the points of this cow.

In the case of a dairy cow, we prefer that the head should be lean and clean cut. There should be no superfluous muscle or meat about it. There should be good width of nostril to indicate good breathing power. The lips should be strong, as this is one of the indications of good digestive powers. This animal is too thick through the face and not enough "clean cut."

The eye should be bright and of good size. This cow's eye is fair; bright, but not very prominent, and a little small. The reason I like a fairly prominent eye is that it indicates the nervous power of the dairy cow. Milk is the product of nervous force, and the eye is the gauge that indicates that nervous force. Nervous energy is generated in the brain; hence the forehead should be high and broad and more dishing than in this case.

The horn should be fine. This horn is perhaps a trifle coarse, but not too coarse considering the size of the cow. The ears should be of moderate size and not too coarse. This cow's ears are a trifle on the coarse side. The neck should be long and slender; not too thick or too beefy. This cow has too heavy a neck. She has too much loose skin and too much lean meat in the neck. She indicates in her head, neck and forequarter a tendency to produce beef rather than milk.

Her forequarter is too thick. The top of the shoulders should be more pointed. Her shoulder is very thick, more like a beef animal. She is also thick through the base of the neck.

She is probably a little prominent in the brisket, but she has plenty of room for the heart and lungs, indicating a good constitution and plenty of vitality, a very important point in a dairy cow, especially from a breeders' standpoint.

Coming back to the barrel; we have there an indication of capacity to use large quantities of food. The probabilities are that this animal will use rather more food than a smaller cow would do, having about the same sized barrel or middle piece. The distance from the last ribs to the "hook" bones should be such as to indicate plenty of room for the stomach.

The backbone of this cow is not prominent enough. The reason we like a prominent backbone is that the nervous force generated in the brain is carried back to the udder along the spinal column. A prominent backbone indicates strong development of nervous force, which is being sent to the udder to produce milk. This cow's spinal column drops down between her shoulders till we can scarcely follow it at all. The forequarters, back and body indicate a cow with a tendency to produce beef rather than milk.

We like to see a strong loin, so that the cow will have strength to carry her calf, and large quantities of food.

The hip boue or "hook" should be prominent, and she should have good length of quarter. The root of the tail and the pelvic arch should be prominent. The pin

bones should be a good distance apart. The flank should be arched, indicating plenty of room for the cow's udder.

The limbs should be strong. In the case of this cow we have perhaps too much development of the leg, as she is a little too high off the ground.

The escutcheon, or milk mirror, should be prominent. This by some authorities is considered a very strong indication of milking qualities. I have not a very great deal of faith in the theory. It is probably one of the indications, but is not nearly so important as some others. The hair on the escutcheon turns up and out. The reason for this is that the hair follows the line of the arteries. The arteries supplying the blood come back to the quarters and then branch out, and the hair follows their direction.

There should be plenty of room between the hind legs for a good udder. Some men lay a good deal of stress on the length of a cow's tail as an indication of milking qualities. Some men will not buy a cow whose tail does not reach to the hock. I have seen plenty of good cows where the tail did not reach to within four or five inches of it. I do not think there is much in that.

I now come to what I consider is the most important point in the dairy cow. Those of you who were here last year will remember that I said, one of the rules of a horseman is "No foot, no horse." My rule in judging a dairy cow, if I have any rule at all is "No udder, no cow." I think if there is one thing more than another that indicates the dairy qualities of a cow it is the udder. Personally I do not lay a great deal of stress upon a fine head, neck or shoulder, but I lay most stress upon a good constitution and upon the size of the middle piece, indicating the capacity of the cow, to use food. But more important still is the development of the cow's udder and the organs connected with it.

We have up to the present been pointing out largely the undesirable points connected with this cow. I now come to what I consider the strong points. This cow has not a large udder—when she is milked her udder is small—but she has a well-formed udder. You will see a great many cows in which the fore-udder is deficient. If you examine a large number of cows, you will not find many with equal development in the front and hind udder. The question has been asked, Why are so many cows deficient in this respect? The explanation is that the arteries supplying the blood enter the udder in the posterior quarters, consequently more blood comes to that part, and it is built up more rapidly.

While this is not a perfect udder, it is a very nice udder, and you will notice that what I call the "udder veins" are quite prominent. I consider this a very important point, as it is an indication of a large amount of blood coming to the udder. The veins are forced to the outside under the skin, and it is a strong indication of milk-producing qualities.

The udder should be covered with soft skin, the hair not coarse or long, and the teats should be of good size. Many dairy cows fail here, and it is very annoying to the man who milks if the cow has small teats. I consider these teats are as near prefection as any I know of. Some of you may think you have cows at home that have nicer ones, but I douht it. They are of nice size, and a man, even with a large hand, will milk that cow quite readily. Some breeders of dairy cattle are paying special attention to the development of good-sized teats. While I am on this subject I want to mention the correct pronunciation of the word, as I do to the students. I find that many of the boys call it "tits;" there is no such word—it is teats. Another thing, a cow does not carry "a bag;" she carries an udder for holding milk. A bag is to put grain or potatoes in.

What are commonly called "milk veins"—coming forward from the cow's udder—should be of good size and more or less twisted; not running straight. The size passes from the udder to the heart and lungs to be purified. Hence these veins of these veins is not due to milk within, but to the impure or venous blood which indicate the amount of blood that comes into the cow's udder. The milk is the product of nervous force applied to the food in the udder. In some mysterious way

which no man has been able to explain, this nervous force in the dairy cow is applied to the blood and it is changed into milk.

The chief undesirable points in this cow are that she indicates a tendency to change her food into beef rather than into milk. This tendency is indicated by a somewhat short, thick neck, heavy forequarters and the carrying considerable fat over the hook bones together with a strong development of hind quarters; but I must say that so long as there is plenty of room between the hind quarters for the udder I am not at all displeased with a cow that carries a fair hind quarter. These are the chief undesirable points.

Her strong points are that she has a good constitution as indicated by plenty of room for the heart and lungs; good digestive capacity as indicated by the length and size of barrel. She has power to change her food into milk as indicated by the udder. She has a fairly well balanced udder, with good sized teats, and under veins quite prominent. These are the desirable points.

Q.: Is she a good cow, anyway ?

A.: I will tell you that later.

Q.: Is she pure bred ?

A.: Her dam was a Shorthorn grade, her sire a pure bred Holstein.

Q.: What about color of skin ?

A.: It indicates to some extent the color of the milk, but the color of the milk and a high percentage of butter fat do not necessarily go together, although they usually do. Light-colored milk may be comparatively rich in fat. The color of the skin is no true indication of the richness of the milk.

Q.: When did she drop her first calf ?

A.: She was dropped in the spring of 1896, and dropped her first calf in November, 1898, when about 2 1-2 years old.

Q.: Perhaps if she had not dropped her calf so late she might not have shown such a tendency to beef ?

A.: That is possible.

Q.: Is it not attributable to the Shorthorn cross ?

A.: It is possible; but we have two other heifers from the same sire and from Shorthorn grade cows which do not show anything like the tendency to beef that this cow does.

Q.: Do not you consider the size of the milk well of more importance than the size of the vein ?

A.: These two things generally go together—a large milk vein requires a large milk well.

Q.: Any value in the color of the horn ?

A.: I think that a yellow horn and skin indicate yellow milk.

Q.: Will yellow milk make yellow butter ?

A.: Yes, if you do not spoil it in the making.

Q.: What season do you consider the best for a heifer to come in ?

A.: The fall. We have some cows come in at all times of the year, so as to have fresh cows milking the whole year round. One reason for having cows freshen in the fall is that cows give more milk, and the milk brings a better price in the fall and early winter.

Q.: What about the quality of the skin ?

A.: I am inclined to think that a very mellow hide is usually associated with beefing qualities—if the hide is too mellow, such as you get in a ripe steer. On the other hand, I do not like a harsh skin, but something that comes between these.

Q.: What about a thin skin ?

A.: It is one of the signs of want of constitution.

Q.: Is not a good quality of hair one of the indications of a good digestion ?

A.: It is an indication both of good digestion and strong circulation. The hair is the part of the animal which is furthest away from the organs of circulation.

Whenever there is anything wrong with the digestion and circulation the hair is improperly nourished, and we have a hair that is dry and turns the wrong way.

The following is the record of the cow from which my address was illustrated. During her first year she gave 6,000 pounds of milk, testing 3.4 per cent. fat, equal to 236 pounds of butter. In the second lactation period she gave 7,410 pounds of milk, testing 3.5 per cent. fat, or 300 pounds butter. During the year she has just finished she gave 7,737 pounds milk, testing 3.7, equal to 328 pounds of butter.

By Robert Robertson, Nappan, Nova Scotia.

I believe there are good cows in all breeds. I have never seen a breed yet that had a monopoly. I am free to admit that I do not know which is the best breed, and I have been trying as hard as most people to find out for a number of years with a good many cows to select from. There are many points which I believe are essential to a good dairy cow, but I am free to admit that I do not know why; I have simply corroborated what someone else has discovered. While my favorite breed is the Ayrshire, I do not maintain that this breed monopolizes all the good cows. I have brought in, as you will see, an Ayrshire cow to illustrate my remarks this evening.

Prof. Dean said how much harder it was to define the points essential in a dairy cow than in a beef animal. This is correct. To my mind, it takes infinitely more skill, intelligence and ability to get to the top as a dairy breeder and feeder than it does in the breeding and feeding of beef animals. The more we know of the dairy cow the more complicated a machine she is. To my mind everything that is right in the beef animal is wrong in the dairy animal. You do not want horizontal or perpendicular lines in the dairy cow.

I can corroborate what Prof. Dean said about a good large mouth being necessary; it is one of the essentials of a profitable cow. A cow will seldom prove profitable unless she has a good large mouth, and a muzzle and nostrils to correspond. But before coming to the head of the cow, we want to see if there is anything to indicate that she has a good constitution or otherwise. Prof. Dean mentioned the thickness of the body behind the forelegs and the width in front of the forelegs. If the cow has not these other characteristics she will not be strong in heart or lungs. A good chest formation shows constitution, and this is of even more importance to my mind in the dairy than in the beef animal. But even if she has a good constitution and has not the mouth which indicates a good feeder, she is not likely to be as profitable as she would otherwise be. This cow has a fairly good mouth, but is deficient in the eye. The eye should be bold. I have never found that the eye could be too large in the dairy cow, as it is an indication of the nervous temperament which is closely associated with the making of milk.

I note that Prof. Dean said he preferred a small horn, and this seems to be a very general opinion. As an Ayrshire breeder in the past, I am inclined to take exception to this. Personally I have every reason for admiring a fairly strong horn. As to the color of the horn and the color of the skin, these things usually agree with the color of the milk, but the color does not indicate what percentage of butter fat the milk will contain.

In a beef animal you require a short, thick neck. The opposite is true of the dairy cow. The outward conformation when rightly understood is a sure indication of whether the animal will lay its feed on its back or put it in the pail. We want a long, slim neck. I have seldom seen one that I thought was too long; but I like to see style in the manner the animal carries its head.

We like the shoulders fairly large, with the backbone on a level with the shoulder blades. The majority of our best dairy cows have the backbone clearly defined standing above the shoulder blades.

Prof. Dean spoke of the broad shoulder. I believe dairy breeders regard this as objectionable. A few years ago Ayrshire breeders had a great fad for a tremendously

sharp shouder. This is good if the sharpness is got by the backbone rising above the shoulder blades and not by the shoulder blades themselves. My choice would be a fairly good width of shoulder verging on light.

The rib bone of the dairy cow should be flat and not round as in the beef animal, and there should be as much space as possible between the ribs. Speaking generally, the dairy cow should be of a loose conformation.

All the more important points in a dairy cow are found in the rear half of the animal. Of all things, we must have a large paunch if the cow is to be a profitable machine for converting large quantities of food into the finished product. The development of a large paunch exercises considerable control over the cow's usefulness in after life.

It is amusing how many people will pin their faith to one particular point in the conformation, and utterly disregard all others. I do not know which point takes precedence over the others, but if there is one it is to my mind the paunch. Prof. Dean says "No udder, no cow." I would be inclined to say "No paunch, and you have a pretty poor cow."

I do not like a long body in a cow. In my opinion it should be short from the hook bones to the shoulder. A light barrel usually goes with a long-bodied cow, and then she is seldom profitable. If she has a long back and a large paunch, carrying a great amount of food all the time it will not be long before she begins to go down in the back. This is very unsightly to the eye. Unless there is a valuable reason for length of back, we had better cultivate something else.

I am not at all averse to having the top line fairly straight, but not perfectly so. Besides the paunch the hind quarters are a good indication of milk capacity. She should not have the squareness of the beef animal behind. I have yet to find a cow too "cat-hammed" to suit me for the dairy. Many are too much the other way. A good many seem to think that a dairy cow can be built with square lines along the back and square lines behind and still be a good dairy cow; I do not think so. A straight back out to the root of the tail, and turning and going square down as in beef animals is antagonistic to dairy qualities.

I may say that I am averse to a high tail root, which comes with thick hips and full in between. The dairy cow should not be round and broad in the hips, but the hips should be incurved. Invariably, I think I may say, when you get a cow long in the middle it takes more food to keep up the animal than one that is shorter. One that is long between the eye and the nose has the same characteristic. The more surface of body the udder covers the better. It does not matter about the shape so long as it covers enough of the body.

Prof. Dean said that a small teat was an objection. I do not quite agree with him there. It is well to have them of a convenient size, but I do not think it is an indication of the milking capacity.

Hon. Mr. Dryden: You speak about the conformation of the dairy cow, but in your remarks you describe the conformation of the Aryshire cow. Would the same description answer for a grade Shorthorn, or of any other breed, which might be an exceedingly good milker?

A.: If you had not said "grade Shorthorn" I would have said, "Yes." I believe that in the ideal conformation the different breeds of dairy cows are identical, although there may be some differences in breed characteristics. My observation is that just as soon as you get a dairy Shorthorn you get a cow that has a good deal of the conformation that is essential to a dairy cow. Whether you can have that with advantage in a beef breed or not I am not prepared to say, but I cannot afford to allow one inch more of the ideal of a beef animal in my dairy cow.

Hon. Mr. Drydeu: Prof. Dean showed me a grade Shorthorn the other day which I do not think conforms to the type described, and yet he says she is an exceedingly good milker.

A.: You will find good milkers in all shapes and forms, but if you go over a good many of them and find from 70 to 90 per cent. with a particular form, you begin to conclude that that form is right.

Q.: Is that cow sprung enough in the rib in the middle?

A.: Yes, I think so, although some authorities would prefer her to be a little more sprung.

Q.: How do you get a large barrel with a rib which is not sprung?

A.: By having the rib of good length, giving a deep barrel.

Mr. Smith: I cannot agree with all Mr. Robertson has said in regard to the conformation of the cow that is to be a good dairy cow. There are a number of points in the beef animal that we want in the dairy cow. We want the wide, deep shoulder; we want plenty of heart and lung room. It is said that a dairy cow must be an ungainly, wedge-shaped animal. We claim that we can produce in the Shorthorn a cow that is comely to look at, and yet a good dairy cow. We claim that we do not require an ugly formation to produce a dairy cow. We had a Shorthorn dairy cow that produced 53 pounds of milk per day, which contained a good percentage of butter fat. We had another of the same family at the Pan-American, where she was much admired in the Model Dairy and gave a very creditable account of herself.

At this point, at the request of the meeting, a Shorthorn heifer belonging to Mr. Smith was brought into the ring.

Mr. Smith: This animal is of the same family as those I have already referred to. She is ten days out of the two-year-old class. Last year she produced a bull calf which we fed on skim milk and sold at ten months weighing 920 pounds. She was taken into the ring and shown in the beef class among very good ones, and won first prize. Another cow closely related to this, gave over a considerable length of time an average of 50 pounds of milk containing 4 per cent. of fat. That cow's first calf was a heifer. She was shown here and won first prize. Her second calf won in Toronto and Winnipeg. Her third was a heifer, and she gave about 52 pounds of milk, testing four per cent. We can get that animal in the Shorthorn type with all these straight lines that are condemned so much, and we can get a first-class beef animal in the same family. We kept a record of this heifer's milk for ten months, and she gave us 10,550 pounds.

Mr. Dryden: Will Prof. Dean give us his opinion of this animal?

Prof. Dean: I have looked her over somewhat hurriedly, but you will notice that she has very many of the characteristics of the dairy cow. She is not a typical dairy animal, but she has the general conformation of a dairy cow. Her udder veins, milk veins and milk wells are strongly developed. I believe it is possible to combine in one and the same animal a fairly good type of dairy cow and a fairly good type of beef animal; but it is not possible to combine the highest type of both in one and the same animal. That animal combines many of the characteristics of both, and I admire her very much. You will find among all dairy breeds many animals that have many of the characteristics of this cow. I consider her milk record phenomenal. I consider it a great mistake that so many of the dairy characteristics have been bred and fed out of the Shorthorns.

Q.: How would you remedy that difficulty?

A.: I would suggest the course followed by Mr. Smith. He has demonstrated that he can develop dairy qualities in the Shorthorn by selection.

Q.: Considering the production of milk and taking the calf into consideration as well, she would be equally as profitable as a first-class dairy cow.?

Hon. Mr. Dryden: "You pay your money and you take your choice."

THE DESIRABLE AND UNDESIRABLE POINTS IN THE MUTTON SHEEP.

By John Campbell, Woodville, Ont.

We have to keep in mind two things in this connection, namely, quality and quantity. It is quite possible to have quantity and yet have an undesirable mutton carcass, and the endeavor must be to get the greatest quantity where the most desirable parts are located.

The division of the sheep for mutton purposes begins at the second rib. There is a difference of two cents per pound in the value of the portion in front of that line, and the portion behind it. The butcher therefore wants a large proportion of hind quarter, and the aim of the breeder should be to produce that, keeping in mind the requirements as to constitution, etc.

I do not think we shall ever reach a point where the breeders' and consumers' ideas will meet. There must be a compromise, for the breeder must have certain parts to an animal which the consumer does not require at all. The breeder knows that hind quarter cannot be produced without sufficient development in front.

Both sides are agreed that there should not be too much neck. The neck must not be long. In the sheep as in the bacon hog, the shoulder should not be heavy, as the most valuable parts are behind. A rubbery feeling along the back of the sheep indicates the presence of a great deal of lean meat.

As to the production of the right type of animal from the breeders' and feeders' standpoint I think that the most important thing is breeding and selection, and after that correct feeding. I do not care how much food you put into an animal, if it has not the proper form to start with you will never make a desirable animal of it. To start with, the right type of animal must have a short neck. There should be width and thickness across the back at the loin, and there must be plumpness and fullness at the twist, or the leg of mutton, and it should be fleshed right down to the hock. There should also be plumpness and fullness along the back over the saddle and the chops. Heavy masses of fat at the tail root are not desirable, neither should there be a lot of loose fat on the under part of the sheep's body.

It must be borne in mind, however, that somewhat different lines of breeding will have to be followed, according to whether you wish to produce finished lambs or finished yearlings; so that you will have to take into consideration what market you are producing for. A short neck will make a good lamb, but not a good yearling. To make good yearlings you require more frame and greater strength of bone. For the lamb market you require something that will produce a chubby, blocky animal with early maturing qualities.

Q.: Do I understand that an animal with a thin neck is desirable ?

A.: Not too thin; but not too long nor too strong a neck; we must get it medium in the wether, but in the breeding sire you must have a massive front.

By J. H. Grisdale, Dominion Experimental Farm, Ottawa.

I have been asked to discuss the fattening of animals more particularly. The qualities which will insure a sheep putting on fat to the most advantage and the most rapidly have to be bred in it. For ages breeders have been working on this line, and I think they have nearly reached perfection. All those who have been trying to produce the best mutton sheep have been working on the line of putting fat on the best carcass. For two or three weeks after beginning to feed an animal you can see no outward evidence that fat is being put on. The reason is that it is all deposited on the inside. At this stage you may take hold of the sheep, and there appears to be very little fat on the outside, but if you killed the animal you would be certain to find an immense amount of fat had been deposited inside the carcass; so that while the sheep begin to increase in weight you will not at first notice any

difference in appearance. By and by it comes to the outside, and first shows itself at the root of the tail. A butcher when examining sheep usually makes a grab at the rump to see if they are fat enough. From there the fat extends among the back, and you will find it heavy in the middle of the back. From thence it extends to the foreflank, the hind flank and the breast. The fat is not always deposited evenly. Sometimes there is a great lump of fat at the tail end. Careless or irregular feeding will cause the fat to gather on the flank. We need most meat where the most valuable cuts are to be found—on the shoulder, along the back and on the leg. If the animal is badly fed the fat gathers in lumps instead of being deposited evenly. For this correct feeding will provide the remedy. There is a tendency in some classes of animals to deposit fat irregularly. It is what is called "patchiness" in cattle. The laying on of fat on the top of the animal is the most important point. When an animal is properly finished you cannot feel the bone along the back. On either side of the backbone the flesh should be of a mellow and elastic character, indicating that the animal has a good growth of good red meat underneath. You want a good strong straight back with the flesh sufficiently firm.

Mr. Smith, Maple Lodge: As to the development of muscle. It is very desirable that all the different muscles should have proper and corresponding development in order to produce a perfect sheep. In order to get a short and fair sized neck, well set on, we require a good development of muscle round the neck and in front of the shoulder. This muscle should extend all the way back over the loin and the rump and follow down inside to the leg. After we have secured that development the feeder can proceed to feed that sheep and secure the animal the consumer wants.

As to selection, you must have a number of good individuals back in the ancestry. Occasionally, even then you will get a poor sheep. The chances are you will not. You do not want an animal too far from the ground, or too long in the legs, or weak in the neck. You should have a well-developed neck, but not long, and a well-developed spring to the ribs and good expansion to the chest.

Mr. John Jackson: I should select a somewhat different animal for mutton purposes than for breeding purposes. First, I would decide on some particular breed; some breed that pleases you. In order to succeed, it is necessary, to my mind, to have a liking for the breed, and I would keep to that breed.

In selecting ewes to breed from for mutton sheep I would take three-year-old animals. You want short-legged ewes, with a good deal of length and roominess. They need not be very strong in the neck, but should have good hind quarters; and they should be good milkers in order that they may give their lambs a proper start. Frequently a poor looking ewe will produce a fine lamb simply because she is a good milker.

The next thing necessary is to choose a good sire. A ram should be strong in the neck, with good quarters and strong legs, and with a good fleece of wool. You will have to continue the selection right along, not only at the start, weeding out the poorest. Do not let the butcher or the drover do the selecting for you, or you will not be able to keep up the standard of your flock. Do your own selecting for market.

As to breeding, early maturity is a very important thing. I think there is more money in year olds, and I would breed for early maturity.

Q.: Have you had any experience in feeding silage?

A.: No, I do not feed it to sheep; I prefer clover hay. Give the lambs a good start; that goes a long way. Pasture does not require to be long for sheep; they will do on short pasture if you can change them often from one pasture to another. It is sometimes said that a flock will not do well if kept on the same farm for a long period. This is all nonsense. Some of the best flocks in England have been on the same pastures for a hundred years. The real cause is found in allowing the drovers to do the culling.

Rape sown with oats is a good, cheap feed. This will give you an abundance of feed at a very low cost. Lambs can be wintered very well on clover hay. Pea straw,

If you can raise it, is good for sheep, and do not be too particular to get all the grain out in the threshing. Breeding ewes should be given very litttle grain, but when about to lamb they should be given oats and bran. After lambing, feed a liberal ration of oats, that the lamb may be pushed. Be sure not to have your lambs ready for market too soon, but have them ready just at the time you expect to sell them.

Question: Have you had any experience in having lambs stunted on too much grain?

Answer: I cannot say that I have, but I think it might be done; it would simply be indigestion.

Question: Would you advise feed roots?

Answer: Yes, a little; they do not hurt a ewe at all if not overfed. They are a very good feed after lambing.

Question: How many sheep could you keep on an acre of ordinary pasture?

Answer: I have kept 100 Southdowns on 12 acres from May 15 till harvest was off.

Question: I should like some of that kind of sheep, or some of that land.

Hon. Mr. Dryden: No doubt it depends on the breed.

Question: How many lambs could you carry on an acre of rape?

Answer: I have never done much with rape.

Mr. Smith: We have had considerable experience, and we have frequently had rape carry from 12 to 15 lambs per acre, and more than that when there is an exceedingly good growth; but of course the crop varies very much. The time will date from September 1 till December 1. I do not mean to say that they are on one piece of land all the time, but I mean with that many lambs per acre, starting with September 1st, and then removing them to another piece to let the first piece grow up again. We sow our first rape about the midle of May. Our main crop is sown in June, from the first till the last, in order to bring it in rotation. That sown on June 1 will come in on September 1. We invariably allow them a feed of grass. If you do not, you will have trouble with their digestion, and they will lose a portion of their ears and fall down. You must have a pasture run to keep them right when feeding on rape. I have heard it said that lambs should be turned on rape for only half an hour a day. We have never actually taken them off when once they are turned on. But we are always careful to turn them on when the rape is dry, and you will find they will not hurt themselves. There is more danger with yearlings and older sheep. Then you must have some caution, as they will eat it more rapidly. Lambs will eat very little if they have access to a field of pasture.

Question: Do you prefer clover or timothy with rape?

Answer: I prefer clover, but if I had my choice I would take June grass.

Question: Don't you think there is more money in selling lambs in the spring, rather than in the fall?

Mr. Campbell: A farmer with plenty of hay and straw and barn room might make it pay well; better than selling in the fall. It would depend a great deal on circumstances and on the market.

Mr. Grisdale: As to the kind of pasture to supplement rape, I think a wrong impression may have been given in saying that clover is preferable to timothy. Mr. Smith tells me clover is preferred because he can get it at that season. Theoretically, timothy is better. The reason rape alone will not do for sheep is that it is strong in flesh-forming food. We want more of the fat and heat forming food, and timothy is better suited for that.

Question: Will sheep take enough grass when on rape to keep them in good condition?

Answer: Our experience is that they will.

Question: Do you approve of feeding oats and bran with rape?

Answer: I would not feed bran along with oats. Oats and corn are better than oats and peas.

Question: How many sheep can be profitably kept on 100 acres, making sheep a specialty?

Answer: About 200 ewes if you have land to raise rape, etc. It depends on a great many circumstances, and each will have to work that out for himself.

Mr. Dryden: We want several strings to our bow. Grow some sheep, some bacon and some poultry. Then if one thing fails you have something else to fall back on.

MUTTON CARCASSES.

By J. H. Grisdale, Dominion Experimental Farm, Ottawa.

I have here a diagram showing the values of the different parts of the carcass. It shows the American prices. The rib roast is the one that is used almost entirely by the hotels in the large American cities. For that reason it sometimes rises abnormally in price. Last week in Chicago, during the time of the Live Stock Show, such cuts commanded between 14 and 16 cents, while the leg was quoted at from 6 to 8 cents. In England it is quite the contrary. From enquiries made last summer in Liverpool, Glasgow and Scotland, we find that the leg is there the most valuable cut. As that is our market, we must pay particular attention to the leg in this country. The rib roast is worth from 9 to 10 1-2 cents, and the leg from 7 1-2 to 9 cents, Chicago prices.

The leg should be full and thick. Here is a specimen of the kind of leg we want on a mutton sheep. Although the sheep is very fat, you can see the lean meat through the fat all over. The flesh should extend well down the leg. At the root of the tail there seems in this carcass to be a surplus of fat. But this is not objectionable, for the reason that this part of the sheep is usually boiled, and a little fat with all that lean meat merely adds to the flavor. The amount of fat should not be extreme at this point, however.

The loin cut is very high in value, generally speaking, the average price in the United States being about nine cents per pound. The price of the rest of the carcass is much lower in comparison to these cuts, and it does not fluctuate very much. In the loin we need a good broad cut, not narrow. The rib cut portion needs to be strong and well developed above the shoulder; broad and thick. We do not want too much fat, but must have width. There should not be more than an inch of fat along the back in this portion of the carcass. The spring of the rib is sometimes objected to as indicating too much fat, but you can never tell as to that until the carcass is cut.

The neck is the cheapest part of all, but if you are to have a good broad animal you must have a short, thick neck; the two things go together. But, generally speaking, the cheap parts of the carcass should be as light as possible.

Of the cheap parts of the animal, the three rib chuck is worth 2 1-2 cents, the breast 2 cents, the shoulder 2 cents, the shank 2 cents, and the neck one cent per pound. The carcasses were then cut up to show the proportion of fat and lean. They were cut as is the custom in Chicago, into three portions: first, the loin; second, the middle ribs or the "hotel rack," as it is sometimes called, and then the three rib chuck.

Professor Grisdale said the carcasses were thick over the back and loin in nearly every case. "Swift and Armour like a medium thickness. There should be about one inch of fat above the diamond or "eye" of red meat. Dark meat is objectionable, and badly bred sheep are apt to be faulty in this respect, while the well bred sheep in the mutton breeds will in nearly every case give a well colored flesh."

Mr. Foulds: The same general laws apply to lambs as apply to bacon hogs. Avoid getting too much fat. Give the sheep plenty of exercise on the sheep run, and do not feed too generously, particularly with fattening foods.

DESIRABLE AND UNDESIRABLE POINTS OF BACON HOGS.

By F. W. Hodson, Live Stock Commissioner, Ottawa.

(Illustrated by living specimens and diagrams.)

Hon. John Dryden : Within the past six or eight years we have almost revolutionized the hog product of this country, but so long as we have living specimens of the undesirable type, such as you see before you here, we have not completed the job.

The object of these discussions is to help us perfect the breeds that are used for the production of the best bacon. The judges at the show are supposed to point out the ideals, picking out what they consider the best animals. This discussion to-night will help us to understand why that is the ideal. Then we will carry it a little further by having a discussion on how the ideal is produced. What we want to do is to make the show educational in every sense. We want to help the people interested in this particular business to understand their business so as to produce the article that will command the best price, and it is all in the best interests of the country generally.

Mr. Hodson is to commence the discussion on "the desirable and undesirable points of the bacon hog." He has both kinds of animals here to illustrate his remarks. It is your business to ask questions. If he does not tell you all you want to know, ask him ; do not hesitate ; let us have the facts brought out.

Mr. W. F. Hodson : I should like first to draw your attention to the fact that there is a relationship between all the parts of an animal. I can best illustrate this by quoting from one of Darwin's works. He says that all the parts of an animal must correspond with one another. As an example, he takes pigeons, and points out that the pigeon, with a short, weak bill, will have a weak constitution throughout. It will also have a short, round body and a short, round head, and the legs and feet will also be short. The reverse is the case with a pigeon with along, strong bill. This bird will have a long, strong neck, long wings, long legs, and long feet. That condition exists throughout the animal kingdom, and you will find it true of breeds and of individual animals.

I wish, first, to call your attention to a diagram showing the different cuts in a side of pork and the market value of those cuts. In judging an animal we must bear in mind the relative values of different parts of the animal, and in breeding we must try to produce animals that have the most meat in the best parts of the body. I have here some illustrations enlarged from photographs taken at the Wm. Davies Company's establishment. The first illustration shows an underdone pig. A large number of pigs of this kind are sent out. It is surprising how many underdone hogs are sent to market even yet. I have seen 200 or 300 of such hogs in a factory at a time. The fault with them is that they are too thin, and are all sold at a loss, both to the farmer and the packer. The packer does not want them, as they restrict his sales. If he sends a large quantity of sides of that character to the Old Country it puts a damper on the demand for Canadian bacon, which is against the interest of the producer. It is very much against the interest of the farmer to produce that sort of bacon, as a pig of that kind is worth at least fifty cents a hundred less than it would be if fed properly.

The next picture is of a pig that is overfed. Such animals are frequently met with, especially in the pens of farmers who put their pigs up in a shed, letting them roast all day in summer and freeze at night. This pig is forced, and is not desirable, because its side will dress too fat and too thick. It, too, is sold at a loss to the packer and to the farmer. It will not produce a pound of pork any cheaper than a pig of the correct bacon model will do.

The next illustration is of an old sow—a very good pig and in as good condition of fat as an old sow should be. I find that while a good many old sows are sent to the butcher, they are too often not in that condition, being too thin. The hams of this

pig may be of some use, but its greatest value lies in the amount of lard it will produce, and the fatter you get her the more value is she to the packer.

The next illustration shows an animal that is very much developed over the shoulder and not enough in the ham. We have here also a living example of the same defects. The best use you can make of an animal of that type is to sell it to the butcher for the young pork trade, when it weighs about 80 pounds. If it is fed for a considerable time, the line of fat down the back will be too thick. Over the shoulder it is what packers call crowned, I believe. That is the kind of animal we used to give prizes to in the old days, when we gave the prize to the animal that had the broadest back. Before this Show was started we were all on the wrong track, and even the best judges were giving prizes contrary to the dictates of the pork packer. We must remember that what pays the packer best will pay us best. The more good bacon they send to the Old Country the greater the demand will be for that bacon.

Our next illustration is the "packer's model." That picture was taken in the yard of the Wm. Davies' Company. The first living model we have before us has a long side, is rather deep and has plenty of bone ; but it is too loose, too slack ; he has large, drooping, coarse ears, and rather a raw coat of hair. Although he has the right length of body, he is of the wrong type and is an unthrifty pig. The right type should have a nose of fair length, good breadth between the ears, a broad forehead, and a very light jowl—get as light a jowl as you can. If you have a pig with a long, thin head and light jowl you will find that the fat is light all down the back.

The jaws should be fairly strong, but not coarse. The ears and neck of this animal indicate that he will not respond well to keep. The neck should not be arched, but moderately strong, and not too heavy or too light. The eye should be fairly prominent, and the ear should be of medium size; not coarse, but soft. If the animal has an ear that is rather thick and stands stiffly, you have one that will produce a good deal of fat meat. The jowl should be light because that and the head is the least valuable part of the animal. The shoulder should be smooth and round from side to side. The shoulder should not be any thicker than the rest of the pig. A straight edge should touch all along the side of the pig. The ribs should be fairly deep and nicely sprung out, but not too wide. The back should be nicely arched, and should not sag. Professor Day is of the opinion that animals that sag in the back, and have a great deal of fat along the back, have only a small quantity of lean meat throughout the carcass.

The loin should be as wide as the rest of the pig. The quarters should be long, with the ham tapering down nicely. The front legs should be wide apart, and the breast nice and full. The legs should be straight—not knock-kneed. The hind legs should be fairly strong—not too small. If you have too small bone, you are likely to have too much fat.

Question : What would you do with undesirable pigs such as the one you have there ?

Answer : Sell them to the local butcher.

Question : What breed makes the best bacon hog ?

Answer : I do not think there is any best breed.

Question : Have Yorkshires improved in the last five years ?

Answer : Yes ; in a marked degree.

Question : Are not the Tamworths considered the best bacon breed ?

Answer : Some people like them, but I think you will get more undesirable Tamworths than any other breed. A good many are "crested," and these kill out number two sides.

Question : What breeds are better than the Tamworth ?

Mr. Dryden : This is a dangerous question. We do not care what breed you use so long as you get the bacon hog.

Question : How are we to do that when you do not tell us the breed ?

Mr. Wilson, Ingersoll : I think Mr. Hodson is a little hard on the Tamworths. We believe that the best cross is between the Improved Yorkshires and the Tamworths.

Question: The local buyers tell me they would rather have my hogs at 225 pounds than most of the hogs they get at 175 to 180 pounds. Does this correspond with the opinion of the pork packer?

Mr. Wilson: Hogs weighing from 160 pounds to 200 pounds may all be ideal. If the hog after he weighs 200 pounds has been fed slowly, is not too fat, and is a long hog he is one of the choicest you can get. The probability is that they get them too fat after they are 200 pounds. They force them too quickly. The ideal hog to-day—the first prize—weighs 213 pounds.

Question: Will the five hogs we have here be slaughtered, so that we may compare the carcass with what Mr. Hodson has told us?

Prof. Day: All but one are marked to be killed.

Question: About how old should a 180 pound hog be?

Prof. Day: I think you will get a better grade of pork at seven months than at five. I had some of both sent in to the Wm. Davies Company, and without knowing the ages, they pronounced the seven months hogs the better lot.

Question: Why are white pigs more liable to scurvy than black ones?

Mr. Hodson: They are not, but you see it in one case and do not in the other.

Question: Is it not a dangerous practice to feed a hog after it reaches 200 pounds?

Answer: I think Prof. Day will answer that in his address later on.

By Prof. G. E. Day, O.A.C., Guelph.

There is no doubt in the world that an animal must be bred right if he is to make a first-class bacon hog. Feeding may modify the carcass, it is true, but it cannot entirely overcome the individuality of the animal. If you take an animal that exhibits a short side, you will have a short side of bacon, no matter what you feed him. The animal that has a tendency to put on fat on his back is going to run that way, and you have to get him on the market at a very light weight—160 to 175 pounds—if he is not going to be excessively fat along the back. Judicious feeding may make the bacon from an objectionable animal pass as No. 1 selection, but an animal must be bred right for the best quality of bacon.

It is worth noting that because certain animals may make No. 1 sides, it does not follow that they are ideal animals. We have here an animal, for example, that I think will make a No. 1 side, but at the same time he is not going to be the ideal No. 1, because he has not the characteristics of an ideal side; he is too short, and his shoulder comes too far back.

In shipping our hogs to the factory I have sometimes been surprised at the number that graded No. 1; but you can find lots that grade as No. 1 that are very faulty. This best hog of the five we have here will make a nearly ideal side.

I am glad these pigs have been brought out, because they show that an animal is not necessarily ideal because he belongs to a certain breed. You will find objectionable animals in all breeds. You must be careful about your selection or you will get inferior animals.

Here, for example, is a Yorkshire with great, coarse, flabby ears, indicating coarseness of skin; long, coarse-boned legs, with lights hams, indicating an excessive proportion of bone to flesh; and a narrow, contracted chest, and long, scrawny neck, indicating hard feeding and slow maturing qualities. It does not follow that it is a good pig because it is a Yorkshire. A strong effort should be made to breed out such characteristics. It is being made, and that type of animal is getting scarcer and scarcer in the breed. The great fault of the Yorkshires used to be that they were hard feeders. That has been, to a large extent, bred out, and the same way with the Tamworths. Now, the question arises: How must the ideal animal be bred? I do not think any hard and fast rules can be laid down. They must be bred with intelligence and brains, and with our eyes open to see all the weaknesses of the breed we are handling, as well as the good points. Because we are breeding a particular breed

we must not get it into our heads that it is perfection. Those men who recognize that the breed they are handling has its weaknesses are the ones who make progress. Nearly all our breeders are waking up to this, and are selecting their pigs with more intelligence than ever before.

Mr. Smith of the "Farmers' Son," said to me: "Why don't you answer that question of breeds once for all, and tell us which is the best breed ?"

We can say what we think, or what we know from our experience—that is all. We have not handled all the pigs in the country, and it is not safe to draw deductions from a comparatively few specimens.

In our experiments we have been feeding representatives of the leading breeds for five or six years. As regards suitability for the export trade, the Yorkshires have rather the advantage. The Tamworths ran them a very close second. The main fault with that breed is a tendency to be somewhat light in the ham, and to have a rather long shank. The Yorkshires are usually given credit for thick bellies ; so is the Berkshire. When you get a right good Berkshire, you have a very good pig. There is one weakness about the Berkshire breed, and that is that many have too much shoulder in proportion to length of side, but intelligent breeders are now trying to overcome this. We have some good Berkshires in the bacon competition to-day. I never saw a better class of bacon hogs generally than those we had to judge to-day. It was a difficult task to judge them, and those of you who have been following the judging will sympathize with us.

We have not had an opportunity of studying the American breeds—such as the Poland Chinas, Duroc-Jerseys and Chester Whites—as fully as the others. They are not as common in this country as the English breeds, and we know less about them. Among these breeeds we have had a number of excellent pigs, but we get too many with a tendency to be short in the side and rather thick along the back. Unless they were marketed at about 170 pounds, the chances were they would hardly grade as No. 1 —not all of them, but rather too many to make them keep up with the Yorkshires or Tamworths we have used.

Another important point is, Which breed makes the most economical gain ? If you take the best representatives of the different breeds, I do not think you will find very much difference. In our experiments they have gone up and down—somtimes one breed and sometimes another being in the lead. In the average of our experiments the Berkshires have made a very favorable showing. They are economical feeders, and that makes them a very valuable breed for crossing. The important thing is to get the right type of hog, and I do not care what breed it is.

Some of us seem to think when we see a pig stretching out and growing, and not getting fat, that it is an expensive feeder. But this is not necessarily the case. It does not necessarily cost a cent more to produce a pound of gain in a pig of the right bacon type than it does in any other type. I have tried to prove it, but I could not demonstrate that the bacon type of hog is expensive to feed. I find it is an economical producer of bacon. There is no proof that it costs more to produce the bacon hog. If you get the right type, and have a healthy, growthy, thrifty pig, that will stretch out instead of getting fat and dumpy, you will have a hog that will feed economically. There may be some difference in regard to their suitability for pen feeding and grazing. I think some of the best grazers are the American breeds, and possibly the Berkshires. That is my experience so far as we have gone, but we have not followed it up very thoroughly yet.

With regard to the matter of quality, it seems to me there is no middle course. We must either go into the bacon hog business thoroughly or else go out of it. We cannot dabble and keep up our reputation for bacon. It is true there is a limited market for heavier hogs, but it is easily glutted. If we were all to attempt to raise that kind of a hog the market would soon be glutted and the price of hogs would be lower than it is to-day. We must either keep up our export trade, or else come into competition with the United States, and then away goes our trade. It is true that, occasionally, higher prices are paid in the American market than here; and we often

hear complaints on that score. Perhaps there is some cause for them, but we might as well endure it patiently, because, during the greater part of the time, the price is higher here than there.

Mr. Hodson has dealt with the question of quality to some extent, but the matter of soft bacon has not been touched upon. I do not think I know all the causes of soft bacon, nor do I think that any one cause is alone responsible for it. We find that as a rule—almost invariably—pigs that are rather too thin or unthrifty from any cause, are almost sure to kill soft. Further, I believe that lack of exercise has a tendency to cause an animal to be soft, for the reason that lack of exercise prevents the development of the muscles and tissues, and under some conditions it tends to make an animal more or less unthrifty. Confinement will cause occasional indigestion, which will lead to unthriftiness. If pigs are fed exclusively on meal and kept shut up in pens, they will often become somewhat unthrifty. The result is a tendency to softness. A hog that is kept growing from the start will almost invariably kill firm, if the feeding has been judicious.

The question frequently comes up, at what age ought a pig to be marketed? We frequently have hogs ready for market at six months. If a hog is held back it will become unthrifty and have a tendency to be soft, so that I am not an advocate of keeping hogs eight or nine months. I think seven months is all right, but it is possible to get a hog on the market at six months if he is of a growthy, thrifty type.

As to what causes firm bacon I would answer, the opposite condition to that of unthriftiness. We have found the dairy by-products specially valuable in producing firm bacon. Where fed, even with corn, they have a marked influence in overcoming the tendency to softness. But many farmers are unable to feed them because they are limited in quantity. Many people condemn roots, but I believe that an exclusive meal ration is bad for a hog. At the same time, I also think that an exclusive root ration is bad. You can go to extremes. In our experiments we have had excellent results by feeding about equal parts by weight of meal and roots. The pigs have come out in excellent shape.

Of four lots sent to the packing house last winter two had been fed roots and two had not. The sorter in the packing house knew nothing about them. He wrote, "There is a distinct difference between lots 2 and 4; they are distinctly harder than 1 and 3." Lots 2 and 4 had been fed roots, while 1 and 3 had not. We found that to be the case right through.

I am doubtful about the advisability of feeding large quantities of roots, but think they may constitute fifty per cent. of the total ration with safety, and afford a better chance of the hogs killing firm, than if no roots were fed. We found that hogs fed in the summer, without green feed, had a tendency to softness, while those fed green feed both outside and in pens, together with a liberal meal ration, turned out firm. Equal weights of green feed and meal gave excellent results.

You can finish pigs on almost anything, presupposing they have had any amount of exercise and have good growth of muscle and tissue before fattening commences. Variety of food is a most important factor in keeping hogs thrifty, and that reacts in producing firmness of tissue.

In regard to the different foods I do not think we can pick out any one grain as being superior to all others. I know that barley is good, so far as producing firm bacon is concerned. Peas are also good, but you cannot feed a pig on pea meal alone. Pea meal is of a heavy, close nature, and must be lightened up; otherwise, when it gets into the pig's stomach it lies in a hard, solid mass and the digestive fluids cannot act upon it. Corn must be used with a good deal of caution. If fed for extended periods it is apt to produce soft bacon. It is least objectionable when used merely to finish well-grown hogs that have had plenty of exercise previous to the corn feeding.

Question: What kinds of roots do you prefer?

Answer: Pigs prefer sugar beets to anything else; mangels come next, and next turnips.

Question: No matter what you feed a pig if you keep it healthy you will have good firm pork; is not that correct?

Answer: There may be exceptions, but, generally speaking, it is correct. A great many people will tell you how cheaply they produce pork by feeding nearly all roots. I do not know whether they have figured it out. The best I could do over the average of a number of experiments was to prove that six to eight pounds of roots are equivalent to a pound of ordinary mixed grain. You can figure out what it costs to produce the roots and the grain, and if it is extremely profitable, all right.

On the other hand, a great many people do not put any value on roots or on pasture. In Denmark they found from extensive experiments that six to eight pounds of mangels are equivalent to one pound of barley meal.

I doubt whether it is advisable to feed roots excessively from the standpoint of quality of meat. I could never get pigs fat by feeding so many roots as some people do, but I find that by feeding equal parts of roots and meal the pigs get as fat as I want them to be.

Question: What causes the large percentages of soft hogs in March and April?

Answer: Because the pigs have been shut up in pens during the winter, and have become somewhat unthrifty. A short time ago the complaint was that soft hogs came in June and July, and the clover was blamed. If hogs are fed almost exclusively on roots I do not think they will produce the best quality of bacon, but equal weights of roots and meal have given us excellent results.

Question: Will cooking the roots make any difference?

Answer: Not in our experience.

Question: What about carrots?

Answer: They are all right; any kind of roots in fact.

Question: What about silage?

Answer: I have never tried it.

Question: Why do you object to green corn?

Answer: I do not; I think a little is all right; but I think they will eat rape better, and that variety is desirable.

Question: What about clover hay?

Answer: That is used simply as an adjunct with other foods. It is useful to distend the stomach where much concentrated food is being used. Rape will take the place of it; or anything of that nature.

Question: Do you purchase or raise the hogs you experiment with?

Answer: We do both.

Question: Did you raise the ones you marketed at six months?

Answer: We raised most of them; we are not often able to purchase them.

Question: If you have a hog of an objectionable type, can you make that hog of the right type by judicious feeding?

Answer: No, you cannot make him right, it is bred in him.

Question: Will not correct feeding produce a perfect carcass?

Answer: It will modify it, but it cannot overcome individuality.

Question: What about cooked feed?

Answer: It is all right if you have the time. The only thing I prefer to have cooked is potatoes; although I believe cooking may have some benefit in very cold weather as it takes the chill off.

Question: Would you feed meal dry or soaked, with roots? We generally feed it dry, and then give them water afterwards.

Answer: It does not make a great deal of difference; but in cold weather, especially if you feed the food soaked, there is a little danger of giving more water than is required. That is the only advantage of dry feeding. We have had hogs fed on wet feed that did as well as those fed dry. Sometimes when you are feeding a lot together they will waste more if it is dry. I am quite favorable to dry feeding on the whole; the pigs eat it more slowly, and if you have conveniences for watering, I think it is a very good plan. You must cook potatoes to get pigs to eat them satisfactorily.

Question: Was not a bulletin recently issued at Washington stating that peas are the best feed for hogs?

Answer: Peas are excellent if feed judiciously, but if they are ground and fed alone they will not give good results. I believe the old plan of feeding them whole was good for the quality of the bacon, but rather expensive.

Question: At what temperature do you keep the pens?

Answer: It varies a good deal with the weather. It is one of the hardest things I know to keep a piggery just right and to ventilate it. Our piggery varies a good deal. We would rather have it between 50 degrees and 60 degrees if we could get it, with proper ventilation. But it is hard to do this in cold weather unless you have artificial heat.

Question: What about the self-feeder for feeding hogs?

Answer: I have never used it.

Mr. Grisdale: We tried an experiment with it last year, and found it took slightly more grain than when we fed the pigs by hand. Of course, there was a saving of time and trouble in feeding, as it was necessary to feed only once a week or once in two weeks, as against three times a day.

Question: To what did you attribute the extra cost?

Mr. Grisdale: I think the pigs ate more than they needed—more than pigs fed by hand would do, because they always had access to it.

I have had some experience in feeding roots. We conducted experiments last year in feeding mangels, turnips and sugar beets. My experience in this respect is somewhat different to Prof. Day's. In some of these experiments we feed a large quantity of roots, going as high as eighteen pounds per day and only two or three pounds of grain. In every case the results were good and the meat turned out hard. The pigs we fed so heavily on roots did not come along quite as fast as those fed on a lighter root ration; and those fed the heavy ration were more expensive. In every case we tried to economize in grain by feeding more roots the pork was more expensive. We find that by feeding about equal weights of roots and grain we get the most economical pork.

A question was asked about the value of peas. We fed a lot of pigs last winter on peas alone. They grew very slowly, but when killed they all turned out No. 1 hard, in fact too hard, and the fat was too thin. None of them had more than half an inch of fat.

Another question was asked as to the reason for the large number of soft hogs in March and April. From our experience we think the penning up of the pigs during the winter is the principal reason, and lack of thrift induced by over feeding of roots, or by under feeding. Do you get any soft hogs, Mr. Wilson, at this time of the year?

Mr. Wilson, Ingersoll: Yes, we had some the other day. Have you had any experience with fine ground corn meal thrown into boiling water; it should not be boiled, however?

Mr. Grisdale: We heard of that experiment two or three years ago, and undertook to find out the effect. We used boiling water on ground meal, but did not get satisfactory results.

Mr. Wilson: The water should be boiling and the meal just thrown into it. We fed some hogs that way, and the results were very satisfactory indeed.

Mr. Grisdale: Did you feed corn meal exclusively?

Mr. Wilson: Yes, exclusively.

Mr. Grisdale: Our hogs were the most unthrifty we had ever had. A question was asked about the value of clover. We find it is almost as good as skim milk where we boil the clover leaves, and give the pigs the leaves and the juice. This is an excellent ration to supplement corn.

Hon. John Dryden: I think in the discussion to-night we have settled several useful points. The first one is that no one of the breeds spoken of here to-night has the monopoly of the bacon type. There are good bacon hogs in all the

breeds mentioned—the Yorkshires, the Tamworths and the Berkshires. Perhaps some breeds have more good individuals than others; as to that I will not say. It is settled that it is possible to get a good bacon hog from any of them.

The second thing settled is that if you want a good hog you must breed a good hog, and that you must make the right selection. You never can correct it in the feeding afterwards.

The third point settled is that a variety of food is best for the hog. If you feed all grain or all roots, or all pasture, you will not meet with as much success as if you combine them. Prof. Day has said that equal weights of roots and grain led to the highest success in his case.

The fourth thing that I think is settled is that if you want to reach the highest success you must feed and handle your hogs so as to keep them in as thrifty a condition as possible. If a pig is unhealthy, it will be soft, no matter what you do. I think that these points at least have been settled, and that we have made some progress in the discussion of this important subject.

Question: Can Prof. Day tell us what quantity of meal and roots he finds most suitable for a pig from 100 pounds to 180 pounds?

Prof. Day: Our usual plan is to feed what they will clean up in twenty or twenty-five minutes; or, better still, what they will clean up before they leave the troughs. As to the exact amount, I think you will find that some hogs up to 150 pounds or 160 pounds will take as high as five to six pounds of meal in a day; others will not. A pound a day is a very fair gain in weight from the time a pig is six weeks old till he is fit for market. You will find where meal is fed exclusively that it will take between four and five pounds of meal for a pound of gain. That gives an idea of about what, on an average, a pig will take; but they vary a great deal individually.

THE KIND OF CARCASS REQUIRED TO MAKE WILTSHIRE SIDES.

By J. W. Flavelle, Toronto.

The work of illustrating this afternoon will be undertaken by some one other than myself. However, if you will let me have a few moments for some general remarks on the bacon industry I shall have fulfilled what I promised to do.

I suppose few of us have considered much that is involved in this export bacon trade. The trade has grown from about $600,000 worth of bacon exported in 1890 to something better than $13,000,000 worth in 1900. It means that there has been distributed among the farmers of Ontario about $250,000 a week or rather better than a million a month as compared with something less than $10,000 a week ten years ago. This means that while ten years ago there were in Ontario curing houses with a capacity of some 4,000 hogs per week, there are now curing houses with a capacity of 45,000 per week. This represents an increased investment in farm buildings for the accommodation of the increased number of hogs, and in curing houses of one and a half millions, independent of the capital required for the manufacture of the bacon.

What has brought about this condition? First, the persistent efforts made by the packers in the earlier years, pointing out the possibilities of this business. I think I am correct in saying that Wm. Davies, sen., occupied the first place in this class of work. Second, the educational work carried on under the auspices of the Governments at Ottawa and Toronto. Third, the active and intelligent co-operation of the farmers, who are now raising more and better hogs than they ever raised before.

I should like to say that the educational work to which I refer being carried on by the Ontario Government of Agriculture is invaluable in its character. The far-reaching influence of this exhibition is very hard to measure. In no respect is it better than in its benefit to the farmers' institute lecturers, who carry away and

scatter over the country the information that is brought out at these illustrated lectures.

There is a common miapprehension as to the extent of the market for Canadian bacon. It is commonly supposed to be unlimited. I think this supposition has arisen from the exhibit of enormous clearances of hog products from the United States ports, and there has been a somewhat natural inference that this trade was open to the Canadian farmer and curer if he cared to take it up. This is quite erroneous. That is to say, these large clearances of hog products are for the trade in the manufacturing districts in the north of England, to supply which the type of hog that makes the Wiltshire side is not the most suitable. Moreover, there is no fair chance of this country competing successfully with our American friends in this direction—in that fat and rather poorer quality of hog which they market in such large quantities in Great Britain.

In the early days of the bacon industry in this Province, farmers were urged to produce a bacon hog which would make a Wiltshire side. I think you were wisely advised. This hog abounds in lean meat is marketed when of a certain size, and has certain characteristics which peculiarly fit him for a Wiltshire bacon hog.

There are four chief sources of supply for Wiltshire bacon—England, Ireland, Denmark, Sweden and Canada. England converts into Wiltshire sides in her curing houses probably about 5,000 hogs per week. Ireland from 5,000 to 12,000. I have no doubt this will surprise many who have heard so much of the Irish bacon trade. Denmark and Sweden supply from 18,000 to 25,000, while in Canada and practically in Ontario, we have curings on an average of 25,000 per week.

We have now reached a point when we as an individual country are producing a larger quantity of Wiltshire bacon hogs per week than any other country.

I should like to call your attention to the fact that the Wiltshire bacon trade, taking it one year with another, makes it possible to pay a higher price for hogs than any other branch of the bacon business would enable us to pay. But it is only a restricted trade, and my judgment is that all the natural conditions of the trade are now present in it. I do not think we shall have any material increase in the killings of hogs in England, Ireland or Denmark. I do not think they can compete with us. We have increased from about 3,000 hogs per week to 25,000, and we have practically made that place for ourselves, crowding out in the interval the few Wiltshire sides that had been made previous to this by United States curers. What I think you will find will be that the killings of hogs in England, Ireland, and Denmark will remain about the same, but that you will claim and take, as you have done in the last ten years, all the increased trade that is possible in the production of Wiltshire bacon. Therefore, it is manifestly the duty of all of us who are identified with this trade to produce for the increased trade that reaches us—and which will come as fast as the development of the hogs in this country will come—as nearly as possible, the ideal class of hog, and the ideal class of bacon.

Is the good work done? I do not think it is. It is always easier to secure the first place than to hold it. If this country is to hold the first place in quantity, selling an article of high excellence on a critical market, she can do it only by being true to the best type of hog on the part of the farmers, and on the part of the packers, by being true to the best and most scientific methods of curing and marketing.

There must be fair play and full confidence between all who are identified with this business. It has been too common a statement—a statement with just sufficient truth in it to make it sound fair—that if the packers wanted the kind of hog they were constantly preaching for, why did they not pay a higher price for it? The packer has to be governed, as you have to be, by the average conditions. He has to buy his hogs, convert them into bacon, market them the best way he can, influence every one who may be handling the product to think the best possible of it. Having done that, he has done all he is able to do, and he must sell the product to realize the best average price he can. He cannot make the price of hogs. He

can only pay such an average price as it may be possible for him to pay, arising out of the average price he secures for his product. If there be collusion, or if there are any improper means for depressing the price of hogs, you have a perfect right to submit the packer to the most severe kind of criticism, but when there is no collusion, where the competitive conditions have been of the most open character possible, there is the possibility of a great deal of mischief being done by a statement of that kind.

There have been too much of average conditions present in the purchase of hogs. It is the duty of the Governments to work to ideal conditions in the theories they lay before you, but as curers we must work on commercial lines. We have to sell only hogs that are of the right kind, but we must continue to buy hogs that are not of the right kind in all sorts of competitive conditions and arrange for such a general average as may truly represent the general average quality. Some of us are more severe than others in that we persist in pulling out unsuitable hogs and paying a lower price for them, but this is not nearly as easy now as when there were fewer of us.

Up to the present time I have hesitated in stating my preference for any particular breed of hogs. It has been a delicate question, and there was some friendly difference of opinion even among the curers themselves. But the time has come, so far as I am concerned, when I must state unequivocally that the hog that suits thi country best for general purposes—for cross-breeding—and the hog that will produce the largest percentage of number one bacon is the Yorkshire. I have not entered into any business for the sale of hogs, but out of the experience of years I am certain that the condition of the bacon is improved by the use of Yorkshire males.

We have a predominant type of hog in the west which is thicker and shorter than those of the north and east. My objection to the Tamworth hog is that wherever it has been used in the west—where it is chiefly used—to cross on any other type, it loses its identity. There have been thousands of sides forwarded to Great Britain this year and sold as No. 2, because right at the shoulder there was an arching of the fat. The Tamworth cross has been the cause of this. I have found that the long Yorkshire hog can be used for crossing in the west without any of these objectionable characteristics, and that it has the faculty of asserting its characteristics, namely, an even quantity of fat down the back and generally lean meat throughout. It is true that the Wiltshire side will be made from hogs of all breeds —even the ones we speak most severely about. What this country is interested in is the production of the largest amount of high class bacon that can be produced under average conditions. We ought therefore to feed hogs that will give that result.

What are the conditions of the trade? Shall we sell our bacon for as high a price as Danish bacon? I think not. I do not think it is our legitimate and wise end. What we want to do is to sell our bacon in England at a sufficiently remunerative price to make the business on this side a paying and a healthy one for all concerned. I am satisfied that if we are to go on increasing in the production of Wiltshire bacon we must sell it at a generally lower price than the Danish, and so keep the Danes from increasing the quantity. I am not advocating a cheap bacon. I should like to see the average price of hogs consistent throughout the year, and I should like it to be a good price; but my judgment is that we have not before us the possibility of selling our bacon on the same basis as continental if we mean to hold the large end of the trade.

We have in Ontario at the present time a delivery averaging 25,000 hogs per week, and curing houses with a capacity of 45,000, or an excess capacity of 20,000 per week. This is your security for competition.

I think that the spirit of co-operation between us all should be carried to a greater extent. I think there should be the widest, fullest and freest discussion of the problems identified with this business. That having been done, there must be mutual confidence. You have to raise the hogs, we have to cure and sell them, and the Government must stand between so as to see fair play.

You see hanging here, for the purpose of illustrating this lecture, a number of sides of bacon that have been sent from our packing house. I have been told since I came here that in exhibiting a side of bacon that we call stout, we were in danger of having the farmers say, it is all humbug; it is a fad and a notion you packers have. I should like to tell you the extent of that fad. This bacon is not selected in Great Britain, but in the curing houses in Canada. A side like that is thrown out by the curer in Canada because it will injure his No. 1 selection if he leaves it in. Any breeder or feeder who says "humbug" only exhibits his lack of knowledge of the real situation, because hogs that are unwisely fed and inclined to be too stout affect the average selling price of bacon.

Question: What percentage of hogs will class as select bacon?

Answer: Our hogs are running about 20 per cent. too fat; about 5 per cent. are running soft, and about 3 per cent. "bruisers," leaving about three-quarters of the bacon No. 1.

Question: Why do you believe that Canadian bacon is not likely to take as high a level as Danish.

Answer: It is more or less a condition of sentiment. Our Danish friends are within twenty-four hours of the market, and they are able to put their bacon on the market without any kind of preservative. They have been under the necessity all these years of immediately marketing it because it will not carry; whereas the Canadian bacon is packed with preservative and in a tight box, and has still to contend with the feeling that it comes from the United States, because there is not yet a clear understanding on that point. All these things contribute to make the price of our bacon from 6s. to 8s. per hundred lower on an average.

Question: Has the average number of bruisers increased any?

Answer: I think it has somewhat. That is a clear loss, and it is all owing to cruelty and bad treatment.

By J. H. Grisdale, Dominion Experimental Farm, Ottawa.

The first side to which I will draw attention is one that grades as a No. 1 selection. You will notice the uniform thickness and evenness of the fat all through. It is from an inch and a quarter to an inch and a half in thickness. This is the kind we want, and we can get this thickness of fat on almost any class of pig we may choose to feed if we feed it properly. There is also something else which it is important to secure; that is, length of side. This side, as you will see, is somewhat shorter and thicker. This thickness is caused by ill-advised feeding or the breeding of the animal; either may produce it. Occasionally we find a pig otherwise a perfect type for the bacon trade, which, if fed longer than it should be, or on fat-producing foods, will grow too thick. The forced pig is the one from which we generally get a fat side. That is entirely against the bacon trade. Such a side cannot be exported at all.

The importance of feeding an animal so as to produce a proper side is hard to overestimate. We have fed a large number of pigs of the bacon type—Tamworths or Tamworth grades, and have got from the same litter sides thicker than the one classed No. 2 in this lot, and thinner than the No. 1 side. By feeding them when they are young on good growing material, then stopping, and then going to a fattening material, you will always get too fat a carcass. We took ten Tamworth grades and fed them on oats, peas, barley and milk for ten months, and on corn and milk during the last three months of their lives, and got very thick carcasses. In almost every case you can spoil the best type of animal by injudicious feeding and produce a second-class carcass, or even worse.

Some breeds show a tendency to fatness. The Berkshires have a tendency to a thick shoulder, which is, however, being bred out. The difficulty lies chiefly in the pigs that have been imported of recent years. On the other side they do not seem to pay so much attention to this, and in almost every case you will find there

that the short, stubby Berkshire with the thick shoulder is in favor. Such pigs have not sufficient length. You can get far better Berkshires here because we select on that line; and in a short time we shall be able to get a perfect carcass from that breed.

An unfinished side is also due to improper feeding. A pig of that kind is usually fed on a very growing ration, until it gets to the right weight, when an attempt is made to finish it off in two or three weeks, and it gets overweight before it is ready to slaughter. The quality even of the lean meat in such bacon is frequently inferior, just as it is in the case of a lean steer. You all know how difficult it is to chew beef if there is no fat on the animal.

Next we have an example of a soft side. The causes of softness have already been entered into very fully, so that I will not discuss it again unless questions are asked. It is impossible to tell from the appearance of an animal whether it is going to be soft or firm. There is one general characteristic which will insure firm meat, and that is thrift. If an animal is kept thrifty right through he will be firm. It is often supposed that the fat hog is the soft hog, but such is not necessarily the case. The thin side may be soft. Fat pigs and soft pigs are entirely different. Generally speaking, fat pigs are firm pigs because they are better finished, while the poor, unfinished pig is frequently soft.

Question: What is the cause of softness.

Answer: The chief causes are the kind of food, the manner of feeding, and the health of the animal. The animal must be kept healthy and growing from start to finish.

Question: What about exercise?

Answer: A certain amount of exercise is beneficial. If you keep them in a fairly large pen where they can get around, it is conducive to health; that is why it is beneficial. Exercise will not harden a pig, but it is beneficial, because it improves the general health of the animal. We have fed a great many pigs at Ottawa them finished. They killed at 120 pounds, and the fat was very light. Others were fed some on corn exclusively from the time they were two months old till finished. It took over a year to get them finished. To speak more correctly, we never really got them finished. They killed at 120 pounds, and the fat was very light. Others were fed corn till they weighted 100 pounds, and then given a flesh producing food. From these we got a rather inferior side of firm bacon—hardly a No. 2 selection. Others were fed a good growing ration till they weighed 120 pounds, after which they were fed corn. They gave an inferior second-class side. When we took corn and milk and fed them together, the milk overcame the tendency to softness, but we got the sides too thick. They grew so rapidly that by the time they got to the right weight, while they were No. 1 in shape, they had become so thick and broad that they were too fat. The impression I want to leave is to avoid corn. The more corn you feed from infancy up the longer time it will take you to produce your pork; that is if you feed corn exclusively. The less corn and the more growing food you use the better quality you will secure and the thicker they will mature.

In another experiment we started off with shorts, and fed peas, oats and barley right through. At six or seven months they were mature, and every one turned out a No. 1.

Others were fed on roots, oats, peas and barley and a little corn. They had a little corn at the last, but it seemed to have no adverse effect. They all produced No. 1 sides. Then we fed clover ensilage and a small meal mixture, and also got No. 1 pork. With rape and some grain mixture we also got No. 1. The same with artichokes. But wherever we introduced corn to an appreciable extent we got an inferior quality.

Hon. Sydney Fisher: Were these rations with milk?

Mr. Grisdale: With milk in every case. Wherever we fed milk, we got a good firm side. When we fed milk and corn the side was of a good quality but a little too fat.

Question: How much milk?

Answer: About three pounds per hog.

Question: At what age?

Answer: We began at two months with that amount and kept it right up. We find if we wish to get the best results it will not pay to give over five pounds, as then the milk loses in value. A hundred pounds of grain is worth about three hundred pounds of milk. When we increase the quantity of milk to, say, eight pounds we find that it takes 600 pounds of milk to equal 100 pounds of grain.

Question: Farmers have an idea that they should grow the pigs on corn and finish them on something else.

Answer: That is the reverse of what should be done. Where we fed pigs on corn exclusively we got an unthrifty and poor animal. Corn lacks in flesh and bone producing matter. Wherever young pigs are fed on it they do very badly, but if they get milk in addition the results are all right. If they are fed corn and some green feed, the results are slightly improved. Exeriments conducted in Wisconsin proved that the bone of corn-fed pigs took only half the power to break as compared with the bone of the pig fed on oats, peas, and barley.

Question: Will flax seed and oil cake give soft pork?

Answer: We have not used it, but experiments conducted at other places do not show any great tendency that way.

Question: What effect has buckwheat?

Answer: We tried it last year and could observe no ill effect.

Question: What would be the effect of mixing rye with oats instead of peas?

Answer: In Danish experiments rye was found to give a rather inferior quality.

Question: Would wheat be a good substitute for peas?

Answer: No; wheat is not of the same composition as peas at all.

Question: We cannot grow peas now, the pea bug eats them all.

Answer: With pigs fed on wheat we got good results so far as economy of gain was concerned, but the quality was not equal to pigs fed on a mixed ration.

Question: What about barley?

Answer: It is considered to be the very best feed for hogs. Barley and milk is an ideal feed for finishing the bacon hog.

Question: Is black barley good?

Answer: I do not know that there is any difference.

Question: Would it not pay to feed shorts and fine ground bran rather than wheat in the mixture?

Answer: I am certain it would. It is impossible to secure good results from one food right along; the animal is never so thrifty. That is a very important point in feeding all animals.

Question: What about the comparison between barley and peas?

Answer: If you want an ideal ration take 1-4 peas and 3-4 oats and barley—equal parts of barley and oats. For young pigs this must be ground very fine or the hull sifted out.

Question: What about barley and roots?

Answer: Roots of course counteract the evil effect of feeding one kind of food, because they are conducive to thrift and vigor and muscle production.

Question: Can oats be used profitable at present prices?

Answer: It is impossible at present prices. The only thing you can give to advantage at present prices is shorts; you can feed that.

Question: Shorts are now running from $20 to $22 per ton?

Answer: Well, that is all right.

Question: Do you feed dry or wet?

Answer: Usually dry; especially when the pigs are in close quarters; they chew the feed better and it is conducive to digestion. If you feed the food cold, feed it dry under almost any condition.

Question: Is six hour's soaking any advantage?

Answer: With cold water? I do not think it. We have found about 24 hours is necessary to give any good results from soaking. There is an advantage in having it chopped.

Question: Have you had any experience with Speltz?

Answer: In the west they have tried some experiments with this feed, and I think have had very good results. In feeding for beef, it has given results practically the same as where oats and barley were fed. So far as feeding qualities are concerned, pound for pound, it varied very little from a mixture of oats and barley. The amount secured per acre is practically the same as barley.

Question: Have you had any experience with the International Stock Food?

Answer: No, but our stations in the west do not speak highly of it.

A Member: Before leaving the question of feeding corn, I think we should discuss it further, because there are a great many people interested in this subject. It is a pity to leave the impression that it is dangerous to feed corn. Do not you think there is a possibility of feeding pigs that are pretty well grown a reasonable ration of corn along with milk, or somethiug of that kind, which would prevent their becoming too heavy and soft?

Prof. Grisdale: If you feed corn along with milk and some other grain, I think you are quite safe for finishing off, but it is better to avoid it when the pigs are young.

Question: Would half corn and half barley be about right?

Answer: I think it would.

Question: What is your experience in feeding a liberal ration of mangels to growing hogs?

Answer: I have fed varying quantities, from 2 pounds to 19 pounds or 20 pounds each day per head. They took in addition very little grain feed where the larger amount was fed, and in almost every case the animals were hearty, growthy and free from any digestive ills.

Question: Is it a cheap food?

Answer: Not the cheapest. When we feed 19 pounds it costs just as much as feeding grain, but when we were feeding from five to ten pounds the ration was much cheaper because the smaller amount of mangels seemed to have a beneficial effect on the digestion, growth and thrift, and more economical gains resulted.

Question: What about sugar beets?

Answer: They are better calculated to produce cheap pork than mangels, valuing the mangels at $2 per ton and the sugar beets at $3.

Mr. C. C. L. Wilson, Ingersoll: In regard to bruised sides, I may say that we get from ten to fifteen per cent. in our packing house. They are bruised by the farmers and by the drovers. Very often they are marked with whip marks. In the factory we try to make our men handle the hogs as carefully as possible.

A Member: I think it is chiefly the drovers who bruise the hogs, not the farmers.

Mr. Raynor: How long can a Wiltshire side be kept without deteriorating in value?

Mr. Flavelle: You should not keep them more than a week or two after they are ready. You cannot carry them with success; it would ruin the trade.

Question: Is it right that you have 70 per cent. of ideal bacon sides in your house?

Mr. Flavelle: In reply to that question I would say that the term "No. 1 Selection" is a commercial term. The side you have before you as No. 1 is presumably an ideal No. 1 side, but there are a great many sides which, while classed commercially as No. 1, are not by any means ideal sides. We throw out sides that are too fat, sides that are soft, sides that are tender, sides that are bruised, but there is a comparatively wide range between the ideal side and many that are included in the No. 1 commercial standard. We run about 70 per cent. in commercial No. 1 sides.

As to bruised hogs, I have seen a man take the iron rod from his waggon to punch hogs. Every punch meant a round bruise. Every time you get a man out of temper with an unreasonable animal, whether it is the drover or the farmer, you are in danger of a bruise, but the bruiser is an expensive charge against the business.

Question : I do not think the blame rests with the farmer particularly ?

Mr. Flavelle : To that I would give the answer that my mother used to give to me when a boy—"If there is any truth at all in the complaint made against you take it to yourself."

Question : How many ideal hogs do you get among the 70 per cent. ?

Answer : About half of them are ideal.

Hon. Sydney Fisher : Is there any improvement with regard to soft pork ?

Answer : It comes in waves. With regard to how long the Wiltshire side can be held my judgment is that there should not be a box of Canadian bacon held over for a single day. If there is a bad market sell your bacon; do not carry it. That is the reason we have these severe and ugly fluctuations in value.

Question : When do you receive the most fat hogs ?

Answer : From now to March. Nearly every November we have an ugly break in price. On that account you carry your hogs over after they are fit and they become too fat.

HOW SOME OF THE EXHIBITS AT THE WINTER FAIR WERE BRED AND FED.

Cattle—By James Bowman, Guelph.

The three cattle, viz., Miss Canada, Miss Quality and Maple Bank King, were all raised in the way good ordinary farmers raise their calves, on skim milk, fed from pail, and meal and hay as soon as they were old enough to eat it. During the winter their feed mostly consisted of hay, roots and meal. Second winter, roots, chaff and a little hay; only pasture in summer. Last year when Miss Canada was started to fatten we fed her meal and oats principally. Roots, chaff and very little hay were fed in spring. When we started to feed Miss Quality we fed mixed meal, oats, peas, bran and a little ground flax and very little green feed. In the fall we added more oil cake and corn to the ration, also roots. We are principally guided by the choice of the animals and give them change of diet.

The steer was fed straw and turnips last winter, and was fed meal for a time and then much the same as the cows.

By James McQueen, Elora.

Louisa was calved in April, and was left with her mother till the first of November ; she was then weaned and afterwards fed turnips, chopped peas and oats —about the same weight of each—two handfuls twice a day, and hay. She was turned out to grass in May and left until the first of November and was then fed turnips, straw and a handful of chop. During the second year she was left on grass from May until November, and was afterwards fed the same as the previous year. The following March we commenced feeding her chop twice a day, one gallon for one month and increased it to three gallons by the last of May. When the turnips were done, we boiled barley and mixed it with chop (one gallon for three feeds). She was kept all summer in a roomy place, and was fed green corn in the stalk as soon as it could be procured. When the mangels came in she was given them until the turnips were ready. We still kept feeding the chop and boiled barley and hay. She was fed in this way until shown.

SHEEP—BY DON. J. CAMPBELL, WOODVILLE.

Our exhibit consisted of eight pur-bred Shropshire and nine Shropshire grades. Three pure-bred ewe lambs were sired by our old champion ram Newton Lord, and have for dams three imported ewes, one bred by Mills, one by Mansell and the third by Williams. Our yearling wethers are also of good blood, one having for sire "Fair Star Dreamer," a Mansell bred ram and a winner at the Royal. His dam was a daughter of Newton Lord's. While the other one was sired by Newton Lord and out of a Mansell bred Montford Dreamer ewe. Two of the three wethers were sired by a son of Newton Lord, and were out of a Canadian bred ewe, while the third was got by another Mansell ram, with considerable Fair Star blood in him, and had for dam a ewe which won first at Madison Square Garden show in New York in 1895.

Grades. One of our yearlings was by Newton Lord, and her dam had four Shropshire crosses on Leicester grade foundation, while the other was a grand-daughter of Newton Lord, out of a common long wool grade ewe, and our two yearling wethers were both got by Fairview Lord, another son of Newton Lord's, and had for dams Grade Leicester ewes, one having considerable more Shropshire blood than the other. We also showed three wether lambs, two of which were got by a grandson of Newton Lord's and out of grade ewes, one Cotswold and the other Leicester, and the third by an imported Cooper ram and out of a high-grade Shropshire ewe. Our two ewe lambs were bred much the same as the first two wether lambs mentioned above, both being great-granddaughters of Newton Lord and out of grade Cotswold ewes.

Feeding. Our yearlings were carried over from last year, all but one being in the 1900 exhibit, and during the winter months had unthreshed peas at one end of the day and clover hay the other, with a liberal supply of cut turnips at noon. When grass came they were turned out, but were given a light feed of mixed oats and bran once a day while the pasture was fesh and increased to twice a day as the summer advanced. About the middle of July we had rape and tares fit to use and changed the sheep from the grass to the rape after it became dry in the mornings. We found it dangerous to turn them on wet rape at once. We then kept them in the barn during the heat of the day, giving them all the tares they would eat in the rack. After giving them a feed of grain about 4.30 in the evening we again left them a short time on the rape, after which we brought them into the yard for the night. This is done to insure safety from dogs. Here they were given another liberal supply of tares for the night. They were treated in this way until turnips were fit to use, which was about the first of September. We kept gradually substituting clover hay and turnips for the tares, which had become strong and rank by that time. We kept increasing the turnips, giving them a liberal feed three times a day, with clover hay and grain twice, and a run on the rape once or twice a day as the November weather permitted. This was as much for exercise as for what they ate. As the season advanced the strength of the grain was increased, using for the last two months a mixture of about two parts split peas, six of oats and six of bran, at all times keeping fresh, clean water and salt before them.

Our pure-bred lambs were dropped before the ewes went to grass. The mothers three times a day were fed on clover hay and a liberal feed of pulped roots, mixed with oat chop and bran. The lambs, besides the nourishment they received from the mothers, had the run of a little pen by themselves through a creep, and there given all the pulped turnips and oat chop, mixed, they would eat, together with clover hay. Everything was kept quite fresh for them. When grass came they were turned out with their dams in the day time and at night had the run of their pen, where mixed bran and oats were kept before them, although they ate very little while the grass was in bloom. They were kept going in that manner until weaning time, which was about the middle of July, after which they were handled much the same as the yearlings, with the grain regulated according to their age. As we

buy all the grade lambs we show, and do not get them into our possession until about the first of September, we do not know so much about their early care, but as a rule In addition to their mother's milk they get nothing but what they pick along the wayside.

By John Park & Son, Burgessville.

Our sheep were bred from imported rams and from home-bred ewes. They were dropped in March and the ewes were kept in until about the middle of May. Before this they were kept in at night and let out on nice days until the weather was warm enough to leave them out nights. Then the ewes were clipped and the ticks go off on the lambs. We dip the lambs and get rid of the ticks early in the spring.

The sheep were fed in the following manner: They were fed clover hay, night and morning, and peas at noon. They were also few a grain ration consisting of oats and bran, with some peas and a little oil cake mixed in. This was fed to the younger sheep. The breeding ewes were fed a bran mash at noon, and also a liberal feed of turnips after they had lambed. They were given a run in the yards on nice days. It is of great benefit to the ewes and lambs to give them plenty of exercise.

When turned out on pasture they were first allowed to run on timothy sod for one month. They were then kept on clover until August. The lambs were then weaned and put in a field of rape. After they had been on the rape for a week or more they were allowed to run in a clover pasture or in the rape, whichever they wished. We find the lambs do better when they have liberty to run on grass and are not confined to rape alone. Those selected to exhibit were housed at night and in the morning let out on rape, clover and rye pasture. They were fed night, noon and mornings. They seem to eat better when kept in at night. At noon they were fed cut rape in a shed after they had been fed their grain, which consisted of oats, peas, bran, and oil cake.

When rape was done in the fall they were fed sliced turnips mixed with a little bran.

By R. H. Harding, Thorndale.

The sheep shown, with the exception of one in the dressed carcass competition, were pure bred Dorsets. One was an Oxford-Dorset cross, out of a pure bred Dorset ewe from an Oxford ram. The yearling wethers were some that were fed along with the wether lambs that were shown at the Winter Fair in 1900. They were afterwards wintered along with the breeding ewes, the principal feed being mixed hay and turnips, with very little grain. As soon as they were turned out to grass they got no grain until July, when they were put along with my show flock until the time of the fall fairs. They were then turned out with my field flock upon rape and clover pasture, without grain, until five weeks before the Winter Fair. They were then put in a pen and fed about two pounds of grain each, composed of about 11-12 oats to 1-12 wheat, with what clover, hay and turnips they would eat up clean. They were let out each day for about an hour for exercise. The lambs were fed in about the same way as the yearlings after they went out to grass in the spring. In the winter as soon as they were old enough to nibble feed, I provided a creep in one corner of the pen, where the lambs could go and feed by themselves. There I fed them a liberal amount of oats and turnips. My hay was composed too much of timothy to make good feed for sheep and lambs. I fed a small quantity of "Bibby Cake," along with the oats and bran, in the summer time. Last year I fed some linseed meal, but the fat on the carcass was quite yellow; I attributed that to the linseed meal, so I am not feeding anything but hay, grain and roots, and I hope to find out this year if that was the cause of the fat being yellow.

By John Hunter, Wyoming.

Our Dorsets were all Canadian bred. Sires and dams also Canadian bred. The two yearling wethers were born in May, 1900. They were with their mothers on the grass till the latter end of August, when they were weaned and turned into wheat stubble which had been seeded with clover; here they were kept for about one month. After that they ran at large on the farm with the other sheep. We had no clover hay but grew peas and oats mixed, and fed that and straw to them during the winter. In the spring they went on the grass till lamb weaning time, when they and lambs were turned into a second crop of clover, and remained there until about the middle of October. By that time we had the corn drawn off the field, and as we had sown rape amongst the corn before the last scuffling, it was up about sixteen inches high. They were turned into it until the 18th of November, when they were put into the stable. The first week we fed more bran than chop on account of them coming off the rape and grass.

The ewe lambs and the two wether lambs were born in April, 1901. They went to grass before they knew how to eat chop, and were with the others as stated above, until the 18th of November. As we had no roots to give them, the six got the first week, 5 pounds of bran, and 2 of chop (oats and barley mixed) per day. The second week, we gave them 7 pounds of chop and 2 pounds of bran, and all the clover hay they could eat.

By T. C. Douglas, Galt, Ont.

How Bred. The Southdown yearling wether was bred from a ewe of my own breeding, sired by an imported ram. The wether was not shown in 1900; I did not consider him forward enough and left him at home. The wether, under one year, was out of an imported ewe and by an imported ram. The grade yearling's dam was a Canadian Leicester, and an unrecorded Shropshire ram. The grade lamb was bred in a similar manner. No special care was given the sheep. They were allowed to roam over the roadways. About six weeks before the Show I took them in and began to give them a little oats and bran, and increased the feed until they got three pounds of the mixture of one-half bran, and one-half made up of oats, barley, peas, wheat, and oil cake, with a tablespoonful of sulphur sprinkled in 100 pounds of mixture.

How Cared For. When raising sheep for flock or exhibition it is most important to attend well to the young lamb, seeing to its comfort, as well as its proper nourishment. When a young lamb comes, every endeavor should be made to keep it warm. If it is inclined to be chilled, cover it with a small cloth. Then see that it gets some of its mother's milk. After accomplishing the above the chances are it will do well. They are allowed to depend on their dams the first months of their lives. When they begin to show signs of a desire to eat, a hurdle is set up with a space wide enough to let the lamb in and keep out older sheep. Here the lambs are fed a little bran, oats, and a few finely pulped turnips, sprinkled with a little sulphur. Once a week they are given a little nice clover hay in one corner.

Sunlight and exercise are beneficial. About the 15th of May they are turned out to grass during the day, when not too cold or wet, and are housed at night. They are fed some bran and oats, two of the former to one of the latter.

When grass becomes abundant and the weather pleasant, they are allowed to roam at will night and day without grain or other food, except salt and water, until the last week in July, when they are kept in the house from the hot sun and are fed clover hay in a rack, so that they may eat when they choose. We begin by giving very little grain at first and gradually increasing it.

When the pasture gets dry we cut a little green corn followed by turnips until they get three pounds each of mixture, one half bran and the other half oats, a little corn, wheat, peas, oil cake and barley.

By John Brown, Galt.

My Hampshire grade wether depended on its dam until the end of September--weaning time. After weaning he was put on good clover pasture up to the middle of November. He was then stabled and fed clover hay, turnips, and about a pound of oats, with a little bran until the end of April. He was then sheared and turned out to grass, and weighed when turned out 170 pounds. After harvest he was given clover pasture and other fields to run on without any grain until the 15th of November, when he weighed 270 pounds, a gain of 100 pounds without any extra feed. From the 15th of November until date of show his feed was clover hay, cut, with one pound of whole corn, and some bran, with what turnips he would eat each day.

By H. Parks, Woodstock.

My Leicesters were bred from imported and home-bred ewes. The grades were from Southdown ewes and Cotswold rams. These lambs were dropped in March, and were taught to eat a little grain and bran mash. When they had learned how to eat I made a creep for them to allow them to go into a separate pen and fed them by themselves. In spring we let them out on nice days and take them in nights until warm weather came. Then I would let them run on a field of rye and field of clover sod. The rye was sown in the fall and made grand early feed. I sowed five acres of rape for August feed, when grass had dried up. Did not feed lambs after they had been turned out for good on grass. Started to feed grain about the first of October, after they were shut in at night, and fed grain before being turned out, and again when taken in. The grain feed consisted of oats and bran and a few peas, and oil-cake. They were fed pulped turnips night and morning, with a little bran mixed, and were also fed cut clover hay.

By J. Jackson & Son, Abingdon.

The animals exhibited by us in the dressed carcass competition at Guelph this year consisted of two yearling wethers and two wether lambs. Their breeding differed in no particular from others of our flock; that is, we make no effort to mate our stock animals for the production of lambs which might be developed into prize-winning wethers. There is no doubt much might be done in this way if there was enough reward in view to induce the attempt. We aim at getting good ram lambs, but find that usually we have two or three that in some particular, more or less important, are not just what we care to send out as stock rams from our flock. These may make first-rate wethers. Thus the wethers shown by us are pure Southdown, bred in the ordinary way and selected for points which will count for excellence when the animals have reached the finished state as "dressed carcases."

It will be necessary to speak of the care given to the yearling wethers since last fall only, as the previous treatment of them will correspond with that given to the lambs of this year. The object in view during winter feeding is to promote growth, avoiding both extremes—not a ration to make very fat, but by all means avoiding at any time a shrinkage. For this purpose we feed plenty of good hay and occasionally pea straw, with some roots, if we have them (last year we had none) and a little grain, in this case mostly oats and bran. While the pasture was good in summer no additional food was considered necessary. Salt, water and shade should always be within reach of the animals. Care must be exercised when pastures get poor, to supplement it with rape, vetches or other green crop.

Beginning some eight or ten weeks before the time of slaughter, a grain ration is added. We feed a mixture of oats, bran, peas or anything else we have, increasing the feed and keeping inside during the latter part of the time.

Now, as to the lambs, we have the breeding ewes in good condition when lambs

are born and then feed the mothers liberally to promote milk production for the benefit of the lambs. We have a place arranged where the lambs may slip through a creep and feed apart from the ewes. They soon learn to eat a mixture of oats and bran, with a little cake, pulped roots and clover. Progress may be expected when pasture begins, but it is well to continue the extra ration for the lambs when the flock come into the barn at night. Again, any shrinkage should be guarded against when pasture fails, though during the hot summer months our wether lambs were rather neglected this year. When the lambs are weaned—about August 1st—we usually begin feeding again on green feed of some sort, unless pasture is fresh. We suffered loss on our lambs this year by not being careful at this point. The grain ration is gradually increased with the growth of the lambs, and as the time of slaughter approaches give heavier grain, and keep inside towards the last. It is important that all the time the lambs should get plenty of flesh producing food, such as fresh pasture, properly cured clover, roots or rape.

SWINE—BY J. E. BRETHOUR, BURFORD, ONT.

The group of three barrows in class 38, section 1, were pure bred Yorkshires and were from a sow of my own breeding and sired by an imported boar. They were six and a half months old at time of killing and weighed 212, 213 and 214 pounds respectively. They were a part of a litter of eleven pigs, and were allowed to nurse the sow until they were eight weeks old, when they were separated from the sow and enclosed in a pen having a small outside yard. Here they were fed a small quantity of barley meal with wheat middlings, to which was added a reasonable amount of skimmed milk. They were fed three times daily in this manner until they were a little over three months old. At this age they were given a run on clover pasture, being fed three times daily with barley meal and skimmed milk. They were allowed to run until within a month of the finishing period, when they were again shut up in the pen and fed almost exclusively on a ration of barley meal. This was continued until within two weeks of time of slaughtering. At this time a slight change was made in the feed as they were inclined to put on too much fat, and we gave as a ration, one part bran, one of middlings, and two of barley meal until the finishing period.

During the time of being fed in the pen a small amount of vegetable food was given in the form of cabbages and sugar beets ; skimmed milk fresh from the cream separator was also allowed twice daily during this period. These pigs, during the entire finishing period were allowed a moderate amount of exercise, sufficient to keep them in a thrifty, healthy condition. I might also mention that great care was taken to keep the pen and surroundings in a clean, sanitary condition. The pigs also were washed when necessary.

The pigs comprising the second group in this contest were fed in a somewhat different manner ; they were matured more slowly during the early part of their life and are two months older than the pigs in the first group. These pigs were weaned when two months old and were treated in a similar manner to the first group until three months of age, when they were turned out and allowed to run in what is called store condition, until about six months of age, at which time they would weigh from 125 to 140 pounds. They were then enclosed in a pen and given all the food they would eat, composed mostly of barley meal, with a small quantity of ground wheat. Scarcely any milk was given to this lot. They made a very rapid gain during the last two months, making nearly one and three quarter pounds daily. No root or vegetable food was given this lot, and they were kept rather closely confined in the pen. I would expect these pigs to cut rather too fat on the back as they did not appear to be as firm as the first group. The age of these pigs will be about eight and one-half months old at time of killing, and their weight from 220 to 230 pounds without being off feed before being weighed.

By G. B. Hood, Guelph.

The hogs which were entered in class 38 were pure bred Yorkshires, the product of Oak Lodge Orangeman 2nd (3365) and the sows Princess May 3rd (2869) and Guelph Princess (3293). They were farrowed, one lot on the 6th, the other on the 12th of May, 1901, and were seven months old when shown. The sows were fed liberally on middlings, ground barley, and oats. At four weeks old they were allowed to go to pasture with the mother. At eight weeks they were weaned, their noses ringed, and the sow put on a patch of tares to graze. They were fed night and morning on middlings and ground barley, with a little oil cake soaked in water for twelve hours. They got no milk after weaning. They were fed about one pound of the mixed meal daily at first. As they got older the quantity was increased. After harvest they had the run of the stubble fields and second growth of clover. They were penned up every night and fed liberally. About the middle of October they were kept penned up, fed all the mangels they would eat, with a daily ration of about 4 pounds of ground wheat and barley. For the last three weeks the quantity of mangels was reduced, and the meal ration increased to about 5 pounds each. As nearly as I can estimate, each hog consumed about 500 pounds of mixed meal, in addition to green feed and roots. A fair average price for middlings and meal would be about 1 cent per pound.

By D. Matheson, Coningsby.

The hogs shown were farrowed June 15th, 1901. Their dam was a pure bred Berkshire and their sire a pure bred Yorkshire.

When a few days old they had the run of the farm yard. At four weeks old they were fed a little shorts and slops. At six weeks old they were weaned and let run on a small field of oats and vetches along with about thirty others. They were next let run on a small patch of peas not quite ripe. After this they were put to work for about two weeks picking the waste peas in peafields. They were then pastured on rape and fed nearly a full feed of shorts in the morning, and dry whole peas scattered on the ground at night, and were given very little milk, about a pail a day to twelve pigs. About November 5th they were put in pens and fed three times a day on the following: Wheat, barley, turnips, and mangels mixed together, equal parts, by measure. The grain was ground fine and the roots were pulped fine. They were given all they would eat up clean of this mixture, and also clean water to drink. These rations were continued up to date of show. They were let out of the pens two or three times a week for exercise.

REPORTS ON EXHIBITS AT THE WINTER FAIR BY THE JUDGES.

Beef Cattle—By Robert Miller, Stouffville.

Shorthorns.

Steers, two years and under three. There was only one shown, the second entry from Minnesota Agricultural College not being present. The one shown was a large, coarse-boned, white steer, well fattened but not as good as this class should produce.

Minnesota Agricultural College had the only entry in the yearly Shorthorn class and he was not present.

Steer calves. This section made the show of the breed. The first prize calf, like the second and fourth, was white. He was a good calf and smooth in his flesh, though thick, and he was covered well over the loin. The second prize calf was good, but not so well covered over the loin nor so thick in his flesh. The third prize calf, a roan, was thick, but had more waste material and did not show nice character; uneven in his

flesh. The fourth prize calf was nice but not fat enough for showing. The fifth prize calf was too slender for a winner.

Cows over three years. The first prize cow was smooth and had a nice quality of flesh. She was rather high at the tail head but was not patchy, she was an easy winner. The second prize cow was a roan and very thick, but uneven and hard in her flesh. An easy second. The third prize cow was not fat enough, but had fair quality and type. The fourth prize cow was not a show cow in any sense—rough and patchy, and too old to bring a fair price for beef.

Two year old heifers. The first was a big, heavy heifer, thick and firm, with a tendency to roll a little on short ribs. Second was a nice little firm heifer. Third was a fairly well fed heifer, not so smooth as second, but a good type.

Yearling heifer. First was a good, well fed, and thick heifer, even and of good type. Second was the best heifer from a breeder's standpoint. A beautiful roan, with evenness and lines to suit anybody. Third was a nice, fat, little, roan, heifer. Fourth was a nice little calf, but too young and immature for the class.

Steer, any age. The competition was between the first prize two-year-old steer and the second prize calf, the first prize calf not being entered. The calf was given the place on account of his quality and better type.

Best cow or heifer. The first prize yearling was first.

Hereford or Polled Angus.

In class over two years the first was given to a Hereford with very thick flesh, of good quality, but with a little unevenness in his upper line. Second was given a deep good Polled Angus heifer, with a nice covering of good flesh. Third was also given to a Polled Angus heifer with a good back, but not so well covered lower down. Fourth was given a big fairly good Polled Angus heifer, lacking some in flesh.

One year old. First was a Hereford, with good, thick, smooth flesh ; a good heifer. Second was a good smooth Polled Angus heifer, not so fat, but of good quality. Third was a Hereford, with uneven flesh.

Calf. First was a good, well-grown well-matured, heifer, in fine condition. Second was not so fat, but a nice, smooth heifer. Third was a nice little calf, too young and immature for a higher place.

Cow. First was a Hereford, a thick, fairly good cow. Second a Polled Angus cow, fat, but not so straight as first. Third a Polled Angus cow. Fourth a Polled Angus cow. Several in this class were in calf, the class should be for breeders or for fat cows; it is not well to mix them.

Galloway or Devon

Over two years. First was a Galloway, with good, even, firm carcass, straight lines and a grand coat. Second was a Devon not well fed and not well formed.

One year old. First was a Galloway heifer, with straight top and bottom lines but not very fat. Second was a nice and straight Devon steer but thin, which made him look leggy and slender. Third was a Devon heifer, thin and paunchy.

Calf. First was a Devon, with lots of quality and flesh ; very nice. Second was a good, thick, strong Galloway heifer. Third a Galloway heifer, very close to second.

Heifer, three years or over. First was a very good Galloway, well fed, smooth, long and level.

Grade or Cross Bred Steer.

Two years and under three. First was a very good Shorthorn grade steer, heavy, thick, smooth, and of the best of character. One that will respond to the feed given him and will cut up well for the shop owner as well. A hard steer to beat, his only weakness being his want of firmness in his flesh. This is the fault that will lose for his feeder sometimes when the competition is what it should be in this class. Second

was a good, thick and firm steer, plenty of size and of good quality, very little waste about him, and very good in his valuable cuts. Third was a Galloway Grade. A very even steer, with a good covering of meat, but with rather strong bone. Fourth was a thick, low-backed steer, with nice hair and good feeding kind, but paunchy and out of type.

One year and under two years. First was a good, thick and well matured steer, even and nice fleshed, a little full at the tail head. Second was a nice kind of steer but lacking in substance and growth, compared with first. Third was a thick, short-legged steer, but rather soft and immature. Fourth was a nice, smooth, steer, too small for the company. Fifth was a fair little steer, lacking a little in covering of ribs.

Calf. First was a very good, thick red calf, well fed and well matured. Second was a good roan calf, with nice hair and of good quality. Third was a very pretty roan calf, lacking in age and growth. Fourth was a good roan calf, a little off its legs, probably for want of exercise. Rather light in hind quarters. Fifth was a fairly good Hereford Grade, not well covered and not so good under hand as at a little distance

Grade cow or heifer under three years. First was a grand, big, thick, smooth heifer, full of both quality and size. A great depth of flesh laid on a well-made frame. She afterwards made one of the two which won the cup for the best pair. Second was a very big, black cow, fairly smooth, and showing more size than is usual with this color. Third was a red cow, not very smooth, but considered the third best in the ring. This is the reason that might be given for several of the awards. Fourth was a nice, smooth, little black cow, not fat enough. Fifth was something new in our show rings. A Buffalo Hybrid with a Galloway, taking this place. Three were on exhibition by Mossom Boyd & Co., Bobcaygeon, Ont. They were very large and fat; had beautiful furry coats.

Grade heifer, two years. First was a nice, little, smooth, well-fed heifer, full sister to winner in last class. Second was a big, fairly good, red heifer, pretty thick all over, and a little high at tail head. Third was a fair black cow. Fourth and fifth were twins, in nice shape for shipping but not for showing.

Yearling Grade heifer. First was a nice, thick and smooth heifer, promising to make a good one. Second was a nice colored roan heifer, fat but not very level. Third was a very good heifer, not very fat. Fourth was a nice little heifer and the same description covers the fifth.

Best Steer Fed in the County of Wellington.

First was a good steer, described in class for grade steer, 1 year old and under two, where he won first.

Steer by Polled Angus sire. First is a big, raw steer, needing a lot of finish in make up and condition before he should be shown.

Grade steer by Shorthorn sire. First was the white steer, afterwards adjudged the best in show, and the mate to the three-year-old heifer when shown for cup. Second was given the yearling Grade steer, first in class and first as best steer fed in Wellington.

Three Export Cattle.

First was given three nice, firm, well finished, not overdone, cattle, smooth and neat, even weights, with firm and good flesh. Second was given three cattle, just a little less even, but well put together. Third prize cattle were fatter, but had more waste and were not so much of the kind needed to supply the best demand in Great Britain.

Best Pair of Cattle, Any Age or Breed.

First was given the White Steer, which was first in Grade class, mated with the roan heifer that was first in Grade heifers, three years old. The White Steer was made first in best steer bred and fed by exhibitor.

The Show was a very good one, being a great improvement on previous shows of this kind held in Canada, though some of the cattle were not so good as they should be in order to gain admission to the winning list.

SHEEP—BY JAMES DOUGLAS, CALEDONIA.

Cotswolds.

Ewe under one year. The first prize lamb was a grand sheep, smoothly fleshed, with a grand back and well sprung ribs, and well fitted. The second was also a good lamb but not so deep in front and not so even. Third was a good lamb, hardly as fat and no so even. fourth was a fairly good lamb. but wanted more filliug of quarters, and the fifth wanted more fittiug but was a good lamb.

Wether, 1 year and under 2. This was not a strong lot. The first was a fair sheep but badly fleshed over the shoulder.

Wether, under 1 year. There was a fairly good lot of sheep. The first was a good lamb, grand back, very even and firm. The second was a good lamb. but not so evenly fleshed as the first, and wanted more covering of flesh on top and shoulders. Third was too fine and close in wool, but handled fairly well. Fourth was a very good lamb of different type. wool was too fine a curl. and fifth was much the same, but not so fat.

THIRD PRIZE LEICESTER EWE LAMBS.
The property of Mr. John Huggard

Lincolns.

Ewe, under one year. In this section there was a specially good lot of lambs and well brought out. First prize lamb was best in fore-end and evenest fleshed over ribs and back, also shoulder. Second was a good lamb, but did not handle so firm and not so well covered on back. Third was also a very even lamb, deep and well shaped, but had not the thickness and was not fleshed over the shoulder as well. Fourth was a very lengthy lamb and a good handler on top, but wanting in front and wanted a wider brisket coming better forward. Fifth was also a good lamb. but was not as fat as the others.

Wether, 1 year and under 2. This was an extra fine. even lot, great substance, and well fitted and of the right sort to fit. First was best through the heart and a thicker, evener top, but the second was a close. good sheep; also the third.

Leicesters.

This was a wonderful lot of ewe lambs. every one a good one. and was a very strong class indeed. First and second were specially goood ones and well fitted. Third

was also a splendid lamb, lots of substance, would have been better of a little more flesh on loin, but a fine carcass. The fourth was also a very fine lamb, but had not the spring of ribs of the others; fifth was also a good, even-fleshed lamb, with lots of quality. After these were taken out there were still some No. 1 lambs left.

Wether, 1 year old and under 2. In this section there were a good lot and well brought out. First was a good, even sheep, firm and smooth, with a capitally fleshed back and full, deep brisket. Second was a fairly good sheep, but his flesh was inclined to be soft and loose, very nice through the heart, but not so nice in front as the other one or as good on top. Third was a nice, smooth sheep, not as fat but very even. Fourth was not very fat, but good quality, very nice and even.

Wether, under 1 year. There were some very good lambs shown here. First and second prize lambs were a nice pair, very smooth and even, a very strong pair of lambs, full of quality. Third was a smooth, nice lamb, evenly fleshed and a good handler, with a stronger neck and a smoother top than the fourth, which was also a good lamb.

Three wethers, under 1 year. First was a good lot, very even and well fleshed. Second was not as even, and third wanted more fitting.

Three ewes, under 1 year. First were a very fine lot, the smoothest and evenest all through, but both second and third lots were good. Fourth and fifth were not quite as even, but a good sort that will do well any place.

First Prize Pen of Southdown Ewe Lambs.
Bred and owned by Mr. John Jackson, Abingdon, Ont

Class 23, for best three ewe lambs. First were good big lambs, great heart girths but all wanted a little in hind quarters, though good otherwise. Second were good strong lambs, one of them a specially good lamb. In the third prize lot one was good but the other two were not so good.

Sheep—By J. C. Duncan, Lewiston, N.Y

Shropshires.

Ewe lamb. There were six in this section, shown by J. Campbell, G. P. Phin and W. E. Wright. John Campbell won first and second with a beautiful pair, evenly fleshed all over; also carrying the true Shropshire type. G. P. Phin won third and fourth with a pair that ought to make grand breeders.

Wether, 1 year and under 2. Eight were shown in this section, and all were good ones and some had honors from Chicago. Richard Gibson won first with a grand model sheep. John Campbell was second and W. E. Wright third.

Wether, under 1 year. Richard Gibson was first and second with his Chicago winners, and John Campbell third and fourth with a good pair, but they lacked finish.

Southdowns

Southdown men may well congratulate themselves, as they were not only the largest class at the show, but for individual merit I think they were unsurpassed by any class shown. In Southdown ewe, under one year, fourteen entered the ring, and anyone who saw the bunch will bear me out in saying that the poorest was good enough for first place at most shows. First and second went to that veteran, J. Jackson; third and fourth to Wm. Martin on lambs of grand quality, but lacking finish in breeders' and consumers' contest.

Yearling wether. Twelve competed in this class. Telfer Bros scored first with their Chicago winner, a grand model for the block, but lacking the type of the breed he was competing in. W. H. Beattie, second, with a good sheep of the Southdown character and grand legs of mutton. T. C. Douglas won third with an even, good sheep.

Wether, under 1 year. Fifteen entered the ring, and to place the awards where they belonged required a judge with a cool head and plenty of nerve, they were all so good.

Dorset Horns.

If the number shown at the Provincial is any criterion of the "dog-proof" sheep, they must be degenerating in Ontario, as the number shown was very small.

Ewe, under 1 year. R. H. Harding, first and second, on lambs of good quality; John Hunter third and fourth on field sheep.

Wether, 1 year and under 2. W. H. Beattie first on a grand, good sheep and well finished for the block. Harding second, and Hunter third.

SHEEP—BY JAS. L. TOLTON, WALKERTON.

Oxfords.

The Oxfords were not out in as strong a force as the breeders would have liked to see. They were represented by S. Evans, Gourock; J. H. Jull, Mt. Vernon; K. Finlayson, Campbellton, and Stephen Barbaree, Nassagaweya.

Ewe, under one year, brought out a string of twelve, among them being some very fine young ewes. Evans won first with a ewe of very fine type and an exceptionally fine handler. K. Finlayson was a close second; the third and fifth also going to this breeder, with J. H. Jull fourth.

Wether, one year and under two, brought out three entries; the first and second going to Jull, to sheep of nice quality and well finished; third to Evans, to a well fattened sheep, though a little lacking in quality.

Wether, under one year, brought out five entries. The first honor went to Evans on a big, strong lamb, carrying plenty of flesh. The second and fourth also went to Evans, and Jull won third and fifth.

Three wethers, under one year, brought out only two entries; Evans being an easy first, with Jull second. Three Oxford ewes under one year brought out four entries. K. Finlayson came first, with three nice, even ewes of good quality and type; Evans a close second with three ewes of nice quality, though not so even in size. Jull was third and Barbaree fourth.

Hampshires and Suffolks

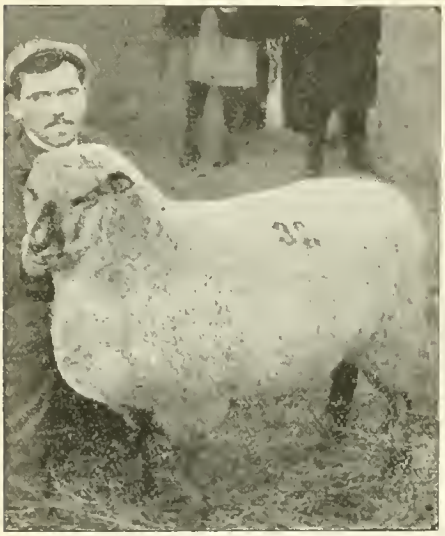
This class was not well represented in some of the sections. Ewe under one year brought out four entries, the red ribbon going to Telfer Bros., to a strong, well-backed ewe; Kelly being a very close second, with a ewe of a little more character than the first prize one; the third also went to Kelly, and fourth to James Bowman's Suffolk ewe.

Wether, one year and under two. In this section there was only one exhibitor, who won first and second with sheep in not particular show fit.

Grades and Crosses.

This was a particularly strong class, and one which gave the judges some trouble in making a decision. Grade or Cross Ewe, 1 year and under 2, brought out eight good sheep, the first going to John Campbell on a very nice, even-topped ewe ; second to E. Brien & Son, to a Grade long wool; third and fourth to J. T. Gibson's grade Lincolns, and Commended to Campbell's Grade Shropshire.

Grade or Cross Wether, 1 year and under 2, brought out a string of sixteen. Good sheep in this section had to be content without a ribbon. First and second went to Campbell's Grade Shropshires; third to R. Gibson's Grade Shropshire; fourth to W. E. Wright's Grade Long Wool, and fifth to James Brown's Long Wool. Three Grade or Cross Wethers, under one year, brought out eleven entries, though some of them were a little lacking in flesh.



First Prize Shearling Shropshire Wether.
Owned by Mr. Richard Gibson, Delaware.

Oxford Lamb.
Owned by Mr. Smith Evans, Gourock, Ont.

Grade or Cross Wether, under one year. This was an exceptionally strong section, there being some 22 entries. First went to Campbell's Grade Shropshire; also fourth and fifth ; second to A. Richardson, Peepabun, Grade Leicester, a big, strong lamb; third to R. Gibson's Grade Shropshire, a lamb of very nice quality.

Grade or Cross ewe, under one year. This was also a well filled section and one which gave the judges some difficulty in coming to a decision. First went to Hastings Bros., Crosshill, to a very fat Grade Leicester; second and fourth to J. Campbell's Grade Shropshires; third to A. Richardson's Grade Leicester, and fifth to G. Walker's Grade Lincoln.

The Sweepstakes went to Campbell's yearling wether, a sheep of nice quality and even flesh.

Swine—By R. H Harding, Thorndale

Berkshires.

When we take into consideration the fact that no aged stock was eligible to compete, we must state that the exhibit of Berkshires has probably never been excelled in America, especially in the younger sow sections. The exhibit taken altogether showed a marked improvement along bacon lines, although there were a few thick, rather heavy-

shouldered ones present. The barrow sections were filled with a good, lengthy, smooth lot. In the section, "Under 9 months" there were eight fairly good ones. There were ten in the younger class. It was in the sections for sows that the closest competition was. In section 3 (nine months and under 15) there were six lined up. A few of them were a trifle thick for their length, but some of them were extra good ones. Section 4 (sows under 9 months) brought twelve head into the ring, seven or eight of them so good that it was difficult to place them. In the section under six months another good lot were turned out, and it was again a hard matter to tell just where the ribbons should be placed. Several of the sows in this class should give a good account of themselves, and no doubt will be heard of again.

SWINE—BY WM. JONES, MT. ELGIN.

Yorkshires.

The pure-bred Yorkshire class was strong in numbers as well as in quality, and each of the sections was well filled. The section for barrows over 6 months, and under 9 months, brought out representatives from the herd of J. E. Brethour, Burford; R. J. Kerr, Mimosa, Colin Campbell, Guelph; John Featherston & Son, Streetsville, and H. Dedels of Breslau. The awards going in the order named to the fourth position. The entry of the last-named exhibitor was set aside on account of showing every indication of being very much over the age called for in the section.

Section for barrows, under 6 months, brought out 6 nice, smooth pigs, of good quality, and the first prize went to H. Dedels, of Breslau, for a very nice, smooth pig of firm flesh and good bone.

The section for sows, over 9 months and under 15 months, brought out four entries. Oak Lodge Clara, shown by J. E. Brethour, was an easy winner in this section, and one that would be hard to beat, as she possessed great length and depth of body, with smooth, firm flesh, and also had plenty of good bone and was of good Yorkshire type. Second and third fell to the entries of J. Featherston & Son of Streetsville, on a pair of nice, smooth sows, carrying more fat, but lacking in length, compared with the first prize sow.

Sows over 6 months, and under 9 months, brought out the strongest section in the class. The entries from the Oak Lodge herd secured first and second prize on a pair of excellent sows, which for length of body, firm flesh and bone, and perfect conformation throughout, would be hard to beat. Third and fourth went to H. J. Davis on a pair of good, lengthy sows of true Yorkshire type, but a little too heavy in pig to show to good advantage.

In the section for sows, under 6 months, H. Dedels secured first and second, while third fell to J. E. Brethour. Three pigs, the offspring of one sow, brought out representatives from the herds of J. E. Brethour, H. Dedels, J. Featherston & Son and H. J. Davis. The entry of J. E. Brethour captured first prize with his first-prize sow in the section over 9 and under 15 months, and his first and second prize sows in section over 6 months and under 9 months, and were a trio that would be hard to beat. Second prize went to the entry of H. Dedels on three pigs under six months.

Tamworths.

Tamworths were a good lot and well brought out as a rule. The section for barrows over 6 months and under 9 months brought out representatives from the herds of A. Elliott & Son, Galt; D. Douglas & Son, Mitchell; J. C. Nichol, Hubrey, and W. M. Smith, of Scotland. The awards were placed in the order named. In the section for barrows under six months there was only one entry forwarded, from the herd of A. Elliot & Son, and received first prize.

The section for sows over 9 months and under 15 months brought out an excellent

lot. Lady Amherst, from the herd of D. Douglas & Son, Mitchell, secured first position and certainly was an excellent sow, possessing great length of body, smooth, firm flesh and good bone. Second prize fell to the entry of A. Elliot & Son, with a good, typical sow of less scale than the first-prize sow. Third fell to the honor of J. C. Nichol whose entry in this class appeared at considerable disadvantage, owing to the fact that his sow, which had won first for him in the sweepstakes at Buffalo, had just weaned a litter of pigs, and so did not appear in good form. She is really a fine sow, and would have taken a better place for him under more favorable circumstances. Sows over 6 months and under 9 months, came next, and were a good lot. First went to D. Douglas & Son, with J. C. Nichol a close second and A. Elliott & Son in third place. The section for sows under 6 months brought out a nice lot, W. R. McDonald of Ridgetown securing all the money prizes in this section.

Three pigs, the offspring of one sow, brought out five lots. First prize fell to D. Douglas & Son, with his first prize sow, Lady Amherst, and second prize barrow in section over 6 months and under 9 months. Second prize went to A. Elliott & Son, Galt, with his second prize sow, over nine months and under 15, and his first prize barrow over 6 and under 9 months, and his third prize sow, over 6 and under 9 months.

Swine—By Thomas Teasdale.

Chester Whites, Poland Chinas, Essex and Duroc Jerseys.

In Chester Whites there were five exhibitors, and nearly all the pigs were in nice condition; no overfed ones, as there have been on former occasions, most of them lengthy and several of them would pass fairly good bacon hogs. The exhibitors were Bennett & Pardo, D. De Courcy, R. H. Harding, W. E. Wright and John Silverthorn.

In Poland Chinas there were only three exhibitors, Smith and Smith being the principal ones. Although the pigs were not as numerous as on some former occasions, most of them were first-class representatives of the breed, and several of them would be hard to beat anywhere.

In Essex there were only two exhibitors, Featherston and McClure. They showed a nice lot of pigs and in nice condition. They were too small for the bacon class, but would be a typical hog for the butchers to sell as fresh pork, being a rather small, smooth hog. Their flesh would likely be fine grained.

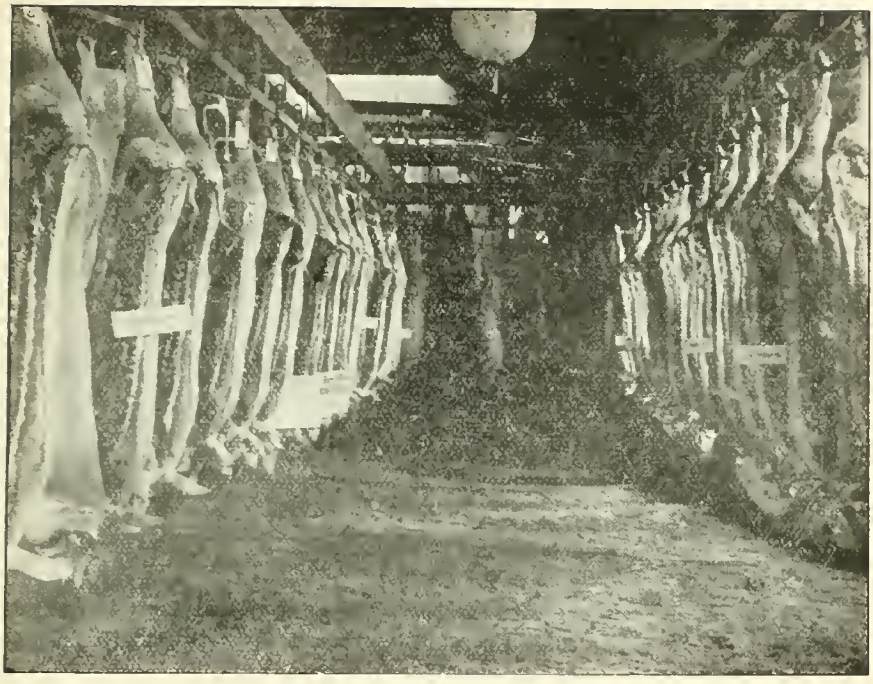
Duroc Jerseys only had two exhibitors, Smith and Tape. Their hogs were in nice condition, and very good representatives of the class.

Grades and Crosses—By R. H. Harding, Tholndale.

While this class is steadily improving, I do not think they have made the same advance as the pure breeds during the last few years, along bacon lines. While in the Berkshire class I judged from both breeders and consumers' standpoints, in this class I judged purely from the consumers' standpoint; I did not consider them an ideal lot for the consumer. Several of them seemed to be carrying too much fat in proportion to weight. The principal crosses seemed to be Berkshire, Tamworth, Chester White and Yorkshire, and had they carried less fat they would no doubt score well at any of the packing houses. The official prize list will give the winnings in each section.

Bacon Hogs—By Wm. Jones, Mt. Elgin.

The live bacon hogs at the Provincial Winter Fair were judged by James Leech, Toronto; Prof. Day of Guelph and Mr. Hodges of Brantford, and myself. The exhibits were without doubt, in both quality and numbers, the best exhibits that have yet been seen at any previous fair. Out of an entry of 29 lots of 3 each in the pure bred class no less than 22 different lots were present for inspection. The task of judging



Dressed Carcasses of Bacon Hogs.

Sides of Dressed Beef Carcasses.

them, under any circumstances would be no small task, but was rendered very difficult owing to the fact that no suitable place could be secured for a proper examination and inspection of so large a number. After a careful examination of the individuals comprising the different groups, the first prize was placed on three Yorkshire barrows, the entry of J. E. Brethour, of Burford, which for conformation and quality, were as near perfection to an ideal bacon hog as we may expect to see produced. Second prize was awarded to J. Featherston & Son of Streetsville, on a pen of pure bred Yorkshires, being somewhat similar in type to the first prize group, but scarcely as well finished. The third prize went to J. E. Brethour, on a pen of Yorkshires, which, although showing excellent quality, were not so uniform as the preceding entries. A pen of Tamworths from the herd of J. R. Newell of Crampton was placed fourth, being well up to the preceding entry in both quality and finish. An entry from the well-known herd of Berkshires of Snell & Lyons secured the fifth position. They were of excellent type, but slightly over-finished, which prevented them from securing a higher place. The sixth position was awarded to the entry of H. Dedels on a pen of Yorkshires, which were of the correct type, but lacked uniformity of finish. The entry of G. B. Hood came in for seventh position, with three Yorkshires of good, even type, but showing less length than the preceding entries. The entry of J. Featherston & Son was placed in the eighth position, with a pen of Yorkshires possessing length of body but of uneven finish. J. C. Nicol secured the ninth award with a pen of Tamworths, and yet there were a number of quite good pens of bacon hogs left without awards.

Grades.

Export bacon hogs, grades and crosses, brought out 14 lots of 3 each, and as a class they were well up to the pure breds in point of quality. The first prize was awarded to A. Elliott & Son of Galt, on a pen of hogs from a Tamworth-Berkshire cross. J. Park & Son of Burgessville received the second prize on a pen from a Yorkshire-Tamworth cross. T. A. McClure captured third prize with three high-grade Yorkshires. R. H. Harding carried off the fourth prize with three of a Yorkshire-Berkshire cross. Fifth position was placed on the entry of J. Rettie of Norwich, leaving outside of the awards still a number of good lots.

The prize for three export bacon hogs from the County of Wellington was awarded to D. Matheson on a pen of grade Yorkshires.

Class 40, bacon hogs from 170 to 200 pounds. In this class J. Featherston & Son won first prize, with a splendid pen of four Yorkshires, weighing from 192 to 196 pounds each. J. E. Brethour secured second prize on four Yorkshires, which were not so uniform in size or finish.

The Sweepstake prize of $50 given by the London Packing Company for the best three export bacon hogs of any breed fell to the honor of J. E. Brethour, on his pen of three pure bred Yorkshire barrows, which secured first prize in the class for three pure bred bacon hogs.

Export Steer.

Two-Year-Old Grade Steer "Champion."
Owned by John Leask, Greenbank, Ont. Winner of Holliday Cup 1901.
This steer was also one of the pair winning the cup offered
by the Bell Organ and Piano Company.

LIST OF PRIZE-WINNERS AT WINTER FAIR.

CATTLE.

Shorthorns.

Steers, 2 years and under 3. Two entries.

1, Geo. Dickie, Hyde Park, Snowball. Sire, Clinton Victor, 21132; dam, Bright Eyes, 23379.

Steer, under 1 year. Seven entries.

1, Jos. Kirby, Armstrong's Mills, Whitey. Sire, King William, 29550; dam, Iris 3rd, 36039.
2, Robt. McEwen, Byron, Blizzard. Sire, Maple Bank Snowball, 28396; dam, Lady Lockhart.
3, G. Walker, Ilderton, Jack Coursey. Sire, Prince Lucas, 33134; dam, Queen Dot 2nd, Vol. xvii.
Highly commended—H. Smith, Hay, Reciprocity. Sire, Knickle Tudor, 72793; dam, Susy.
Commended—J. Fried & Son, Roseville, Stamp. Sire, Kindlar Stamp (imp.), 28867; dam, Victoria of Roseville, 21760.

Cow or Heifer, 3 years and over. Four entries.

1, Andrew B. Baxter, Hamilton, Beauty. Sire, Mountain Hero, 20954; dam, Vivian, 28144.
2, J. & R. McQueen, Elora, Lady Louisa XV. Sire, Baron Roy, 12707; dam, Blythewood 4th, 18239.
3, Jno. Brown, Guelt, Vacuna 45th, Vol. xvi. Sire, Cavalier, 22603; dam, Vacuna 10th, 20258.
Highly commended—J. & W. B. Watt, Salem, Lady English 3, 21078. Sire, Musketeer, 10740; dam, Lady English, 15380.

Heifer, 2 years and under 3. Four entries.

1, H. Smith, Hay, Barmaid. Sire, Abbotsford, 19446; dam, Bonnie Brier.
2, E. Jeffs & Sons, Bond Head, Felicia. Sire, Prince Arthur, 23777; dam, Simcoe Maid, 15069.
3, Jas. Gibb, Brooksdale, Nerissa Jewel, Vol. xvii. Sire, Maxon, 24864; dam, Lady Nerissa, 29740.

Heifer, under 2 years. Five entries.

1, Jas. Leask, Greenbank, Money May, 40462. Sire, Lord Moneyful, 27623; dam, Mayflower 7th, 30157.
2, E. Brien & Sons, Ridgetown, Easter Lily. Sire, Earl of Howard, 29986; dam, Duchess of Kent, 26490.
3, J. Fried & Son, Roseville, Roan Queen, Vol. xvii. Sire, Kindlar Stamp, 28867; dam, Victoria of Roseville, 21760.
Highly commended—E. Jeffs & Sons, Bondhead, Fairy Belle. Sire, Prince Arthur, 23377; dam, Simcoe Maid, 15069.

Best Steer. Eight entries.

1, Robt. McEwan, Byron, Blizzard.

Best Cow and Heifer. Five entries.

1, Jas. Leask, Greenbank, Money May.

Hereford or Polled Angus.

Steer or Heifer, 2 years and under 3. Four entries.

1, F. W. Stone Stock Co., Guelph, Peach 34th, 95240. Sire, Barbeti, 68977; dam, Peach 28, 63844.
2, Walter Hall, Washington, Queen of Scots 2, 42513. Sire, Lucretius, 17109; dam, Queen of Scots, 42511.
3, Walter Hall, Washington, Maple Bank Flora, 33692. Sire, Royal Blackbird, 16556; dam, Flora of Kinnone Park, 15882.
Highly commended—Walter Hall, Washington, Newtona 3, 33691. Sire, Lucretus, 17109; dam, Newtona, 12903.

Steer or Heifer, 1 year and under 2. Five entries.

1, F. W. Stone Stock Co., Guelph, Peach 36th, 109047. Sire, Lord Ingleside 4th, 83599; dam, Peach 28th, 63844.
2, W. Hall, Washington, Newtona 4, 38932. Sire, Laird of Tweedhill, 29486; dam, Newtona, 12903.
3, F. W. Stone Stock Co., Guelph, Peach 35th, 101444. Sire, Rex of Ingleside, 68707; dam, Peach 24th, 63843.
Highly commended—Samuel Young, Binkham, Springside Beauty, 670. Sire, Campbell of Tweedhill, 28216; dam, Colan of Springside, 555.
Commended—Jas. Bowman, Guelph, Elm Park Kyma 10th, 38850. Sire, Emilyn of W. G., 20984; dam, Kyma 4th, 24534.

Three-Year-Old Grade Heifer "Bess."
Owned by James Leask, Greenbank, Ont. One of the pair—
winners of the Bell Organ Co's Cup, 1901.

Export Steers.

Steer or Heifer under 1 year. Four entries.

1, Jas. Bowman, Guelph, Elm Park Kyma 11th, 45947. Sire, Oxford King, 24359 ; dam, Kyma 3, 19809.
2, Jas. Bowman, Guelph, Elm Park Mayflower 3, 45948. Sire, Kyma Heir, 24835 ; dam, Kyma of Tweedhill, 17606.
3, S. Young, Binkham, Springside Alexandria, 47501 Sire, Campbell of Tweedside, 28216 ; dam, Addie Mc, 29313.

Cow or Heifer, 3 years and over. Four entries.

1, F. W. Stone Stock Co., Guelph, Duchess of Moreton 22, 83949 Sire, Barbette, 68977 ; dam, Duchess of Moreton, 14th, 58638
2, W. Hall, Washington, Newtona's Promise, 29662. Sire, Lucretius, 17109 ; dam, Newtona, 12903.
3, W. Hall, Washington, Newtona 2nd, 26439 Sire, Emilyo. 13211 ; dam, Newtona, 12903.
Highly commended—Jas. Bowman, Guelph, Elm Park Mayflower, 27224. Sire, Lord Aberdeen 2, 19810 ; dam, Kyma of Tweedhill, 17606.

Special.

First premiums won in the above class by Aberdeen Angus, were increased 75 per cent. by the American Aberdeen Angus Breeders' Association, if recorded in the Herd Book of the above Association.

GALLOWAYS AND DEVONS.

Steer or Heifer, 2 years and under 3. Four entries.

1, A. M. & R. Shaw, Brantford, Flora McErin 2, 15040. Sire, MacCartney, 9739 ; dam, Flora McErin, 5735.
2, W. J. Rudd, Eden Mills, Joker. Sire, Will B., 1034 ; dam, Beauty Bird, 1031.

Steer or Heifer, 1 year and under 2. Four entries.

1, A. M. & R Shaw, Brantford, Belle B. 2nd, 16890. Sire, College Gambler, 12808 ; dam, Belle B. of High Park.
2, W. J. Rudd, Eden Mills, Bormee. Sire, Indian Chief, 1036 ; dam, Lady, 1020.
3, W. J. Rudd, Eden Mills, Ladysmith, 1175. Sire, Conqueror, 1053 ; dam, Mess, 1030.

Steer or Heifer, under one year. Six entries.

1, W. J. Rudd, Eden Mills, Cracker Jack. Sire, Hero R , 1049 ; dam Ella, 1128.
2, A. M. & R. Shaw, Brantford, Winsome Charters, 18978. Sire, Charters, 14627 ; dam, Belle B. of High Park, 11738.
3, D. McCrae, Guelph, Lismore Lady, 18491. Sire, Gladstone Boy, 13879 ; dam, Lismore Lila, 12972.
Highly commended—W. J. Rudd, Eden Mills, Ruby 2, 1178. Sire, Hero R., 1049 : dam, Trilby, 1085.
Commended—T. Lloyd-Jones & Son, Burford, Alpha II. Sire, College Gambler, 12808 ; dam, Alpha.

Cow or Heifer, 3 years and over. Two entries.

1, D. McCrae, Guelph, Adela of Wentwerth, 13977. Sire, Canadian Borderer, 5945 ; dam, Adela 3rd, 5910.

GRADES OR CROSSES.

Steer, 2 years and under 3. Nine entries.

1, Jas. Leask, Greenbank, Champion. Sire, Moneyfuffil Lad, 20521.
2, R. J. Robinson, Ailsa Craig, Billy. Sire, Duke of Saxony.
3, T. Lloyd & Sons, Burford, Pride of the Oaks. Sire, College Gambler, 12308.
Highly commended—J. Fried & Son, Roseville, King David. Sire, Bob Anderson, 23691.
Commended—R. J. Robinson, Ailsa Craig, Sandy. Sire, Duke of Saxony.

Steer, 1 year and under 2. Thirteen entries.

1, Jas. Green, Fergus, Nichol Hero. Sire, Hesplen Hero, 29549.
2, Jas. Leask, Greenbank, Bobs. Sire, Royal Banner, 27652.
3, Jno. Dickieson, Eramosa, Roger. Sire, Stanley Roan, 27764.
Highly commended—J. Fried & Son, Roseville, Dumpling. Sire, Kivellar Stamp, 28867.
Commended—E. Brien & Sons, Ridgetown, Saxon. Sire, Earl of Howard, 29986 ; dam, Duchess of Kent, 6, 26490.

Steer, under 1 year. Eleven entries.

1, J. Fried & Son, Roseville, Bob. Sire, Kivellar Stamp, 28867.
2, N. H. Black, Rockwood, Little Jim. Sire, Imperial, 29175.
3, A. McDougall, Guelph, St. Patrick. Sire, Pride of the Morning, 23703.
Highly commended—J. Fried & Son, Roseville, King of Roseville. Sire, Kivellar Stamp, 28867.
Commended—Geo. Watson, Inverbaugh, Jersey. Sire, Sir Wilfrid, 794.

Cow or Heifer, 3 years or over. Seven entries.

1, Jas. Leask, Greenbank, Bess. Sire, Moneyfuffil, 20521.
2, Jas. Bowman, Guelph, Miss Canada. Sire, Lord Aberdeen ; dam, Blooming Rose.
3, Jas. Green, Fergus, Daisy. Sire, Bridesman, 23064.
Highly commended—Jas. Bowman, Guelph, Miss Quality. Sire, Lord Aberdeen ; dam, Blooming Rose.

Heifer, 2 years and under 3. Five entries.

1, Jas. Leask, Greenbank, Belle. Sire, Moneyfuffil Lad, 20521.
2, J. Fried & Son, Roseville, Daisy. Sire, Lord Willison, 24315.
3, G. & W. Parkinson, Eramosa, Dora. Sire, Polled Angus ; dam, Shorthorn.
Highly commended—Jas. W. Benham & Sons, Rockwood, Jeanette. Sire, Maxwell, 23783.
Commended—Jas. W. Benham & Sons, Rockwood, Jean. Sire, Maxwell, 23783.

Heifer, under 2 years. Six entries.

1, Jas. Leask, Greenbank, Lady Kirkleviogton. Sire, Royal Banner, 27652.
2, M. Wolfe, Hespeler, Peggy. Sire, Prince Lincoln, 23368.
3, Geo. Kitching, Corwhin, Fancy. Sire, Scottish Chief, 25525.
Highly commended—J. Fried & Son, Roseville, Jimmy. Sire, Kivellar Stamp, 28867.

Dressed carcasses, pure bred. Six entries.

1, W. J. Rudd, Eden Mills.
2, Jas. Gibb, Brooksdale, Nerissa Jewel. Sire, Maxon, 24864 ; dam, Lady Nerissa, 29740.
3, D. McCrae, Guelph.
4, J. & R. McQueen, Elora, Lady Louise, Vol. XV. Sire, Baron Roy, 12707 ; dam, Blythewood 4th 18239.

Dressed carcasses, Grade or Cross. Eleven entries.

1, John Brown, Galt.
2, Jas. Bowman, Guelph, Maple Bank King. Sire, Lucretius (146), 17109.
3, T. Lloyd Jones & Sons, Eurford, Bonnee. Sire, College Gambler, 12808.
4, J. Fried & Son, Roseville, Joe. Sire, Crumeni Chief. 24619.

Best dressed carcass. Nine entries.

1, Jas. Bowman, Guelph.

Best Grade Steer, fed in County of Wellington, and owned three months previous to show. Eight entries.

1, Jas. Green, Fergus, Nichol Hero. Sire, Hespen Hero, 29549.

Best Grade Steer, sired by pure bred Shorthorn bull. Twenty-eight entries.

1, Jas. Leask, Greenbank, Champion.
2, Jas. Green, Fergus, Nichol Hero.

Best three export steers. Eight entries.

1, G. B. Hood, Guelph.
2, John Brown, Galt
3, J. Fried & Sons, Roseville.
4, G. B. Hood, Guelph.

Best pair fat animals, any age or breed, bred and fed by exhibitor. Nine entries.

1, Jas. Leask, Greenbank, Champion and Bess.

Best animal, any age or breed, bred and fed by exhibitor. Twenty-four entries.

1, Jas. Leask, Greenbank.

SHEEP.

COTSWOLD.

Ewe, under 1 year. Eighteen entries.

1, J. C. Ross, Jarvis, Bountiful, 25296. Sire, Jacobs' All Wool, 16451 ; dam, Ross Ewe, 109.
2, J. C. Ross, Jarvis, Beauty, 25297. Sire, Jacobs' All Wool, 16451 ; dam, Ross Ewe, 114.
3, E. Brien & Sons, Ridgetown, Briens 28, 24780. Sire, Joe, 19648 ; dam, Shore Duchess, 15, 13850.
Highly commended—John Rawlings, Ravenswood, Rawlings 568, 25141. Sire, Trump, 16181 ; dam, Porteous 853, 16102.
Commended—J. C. Ross, Jarvis, Princess, 25299. Sire, Jacobs' All Wool, 16451 ; dam, Ross Eve, 104.

Wether, 1 year and under 2. Three entries.

1, John Park & Sons, Furgessville, Parks, 24728. Sire, Hopeful, 16182 ; dam, Park Ewe, 19970.
2, John Park & Sons, Furgessville, Parks, 24729. Sire, Hopeful, 16182 ; dam, Park Ewe, 19984.
3, John Park & Sons, Furgessville, Parks Lad, 24730. Sire, Diamond Jubilee, 14349 ; dam, Peter, 12852.

Wether, under 1 year. Eight entries.

1, John Rawlings, Ravenswood, Rawlings' 580. Sire, Trump, 16181 ; dam, Fichts 144, 19524
2, John Rawlings, Ravenswood, Rawlings' 562 Sire, Trump, 16181 ; dam, Rawlings 366, 15305.
3, John Park & Son, Burgessville, Bold Boy, 24723. Sire, Swanwuck, 21920 ; dam, Park Ewe, 21567.
Highly commended—John Park & Son, Burgessvi le, Moneymaker, 24756. Sire, Swanwuck, 21920 ; dam, Park Ewe, 21567.
Commended—John Rawlings, Ravenswood, Rawlings 620. Sire, Rawlings 524, 21818 ; dam, Cora, 20411.

Three Wethers, under 1 year. Three entries.

1, Jno. Rawlings, Ravenswood, Rawlings, 581 and 580; Milne 37.
2, Jno. Park & Son, Burgessville, Bold Boy, Money Maker, Cornicracker.
3, Jno. Park & Son, Burgessville, Clinker, 24742; Hard to Find, 24723; Noffy.

Three Ewes, under 1 year. Seven entries

1, J. C. Ross, Jarvis.
2, Jno. Rawlings, Ravenswood, Rawlings, 576 and 631 ; F. Rawlings 18.
3, R. Brien & Sons, Ridgetown, Briens 26, 27, 28.
Highly commended—Jno. Park & Son, Burgessville, Fleecy, Whitelocks, Beauty
Commended—Jno. Rawlings, Ravenswood, Rawlings, 614 and 558, F. Rawlings 19.

Dressed Carcass—Cotswold wether - 1 year and under 2. Three entries.

1, Jno. Park & Son, Burgessville, Park Ewe, 24800.
2, Jno Park & Son, Burgessville, Park Ewe, 24799.
3, Jno. Park & Son, Burgessville, Park Ewe, 24801.

Dressed Carcass - Cotswold wether—under 1 year. Six entries.

1, Jno. Rawlings, Ravenswood, Rawlings, 580.
2, Jno. Park & Son, Burgessville.
3, Jno. Park & Son, Burgessville.

LINCOLNS.

Ewe, under 1 year. Nine entries.

1, J. T. Gibson, Denfield, Gibson's 68, 9315. Sire, Dennis 8, 9299 ; dam, G & W 95, 3330.
2, J. T. Gibson, Denfield, Gibson's 70, 9317. Sire, Dennis 8, 9299 ; dam, G & W. 77, 3334.
3, G. Walker, Ilderton, G W. 739 ; sire, Stevens 117, 7405 ; dam, G.W. 170, 1074
Highly commended—G Walker, Ilderton, G.W 733. Sire, Stevens 117 ; dam, R.S.R. 5, 3919.
Commended—G. Walker, Ilderton, G.W. 735. Sire, Sir Roger, 3318 ; dam, Lena 2, 5411.

Wether, 1 year and under 2. Three entries.

1, J. T. Gibson, Denfield, Gibson's 12, 8276. Sire, Riby Conqueror 503 ; dam, Barton's 40, 1000.
2, J. T. Gibson, Denfield, Gibson's 15, 8278. Sire, Riby Gem ; dam, Barton's 40, 1000.
3, J. T. Gibson, Denfield, Gibson's 16, 8279. Sire, Riby Gem, 3324 ; dam, Barton's 1, 962.

Wether, under 1 year. Six entries.

1, G. Walker, Ilderton, Jack. Sire, Riby Gem, 3324 ; dam, G & W. 17-458.
2, G. Walker, Ilderton, Jim Sire, Riby Gem, 3324 ; dam G & W. 17, 458.
3, J. T. Gibson, Denfield, Gibson's 78. Sire, Denis 8, 9299 ; dam, No. 5, 327.
Highly commended—J. T. Gibson, Denfield, Gibson's 79. Sire, Denis 8, 9299 ; dam, No. 5. 327.
Commended—J. T. Gibson, Denfield, Gibson's 80. Sire, Denis 8, 9299; dam, Barton's 1, 962.

Three Wethers, under 1 year. Two entries.

1, J. T. Gibson, Denfield.
2, G. Walker, Ilderton, Jack, Jim, Tom.

Three Ewes, under 1 year. Three entries.

1, J. T. Gibson, Denfield.
2, G. Walker, Ilderton.
3, G. Walker, Ilderton.

Dressed Carcass—Lincoln wether—1 year and under 2. One entry.

1, J. T. Gibson, Denfield.

Dressed Carcass—Lincoln wether—under 1 year. Two entries.

1, J. T. Gibson, Denfield.
2. G. Walker, Ilderton, Jim.

LEICESTERS.

Ewe, under 1 year. Twenty-one entries.

1, Jno. Kelly, Shakespeare, 4911.
2, Jno. Kelly, Shakespeare, 4905.
3, A. & W. Whitelaw, Guelph, Sally Annison, 4938. Sire, Albino, 4077 ; dam, Mary Annison, 2, 2490.
Highly commended—A. & W. Whitelaw, Guelph, Sally White, 4939. Sire, Albino, 4077 ; dam, Mary Annison, 3, 2489.
Commended—A. & W. Whitelaw, Guelph, Pretty Biddy, 5330. Sire, Albino, 4077 ; dam, Biddy of Guelph, 3160.

Wether, 1 year and under 2. Four entries.

1, Orr & Lillico, Galt, Jack, 5235. Sire, Klondike, 2577; dam, Vic, 1556.
2, J. M Gardhouse, Highfield, Lucky Charlie.
3, Jno. Kelly, Shakespeare, 4427.

Wether, under 1 year. Six entries

1, Orr & Lillico, Galt, Jim, 5232. Sire Klondike, 2577 ; dam, Nettie, 1560.
2, Orr & Lillico, Galt, Bob, 5233. Sire, Klondike, 2577 ; dam, Jean, 1536.
3, J. M. Gardhouse, Highfield, Alf.
Highly commended—Orr & Lillico, Galt, Charlie, 5228. Sire, Klondike, 2577; dam, Bess, 1561.
Commended—H. Parkes, Woodstock, Jim. Sire, Joseph B. 602; dam, Snowflake, 3672.

Three Wethers, under 1 year. Three entries.

1, Orr & Lillico, Galt, Jim, Bob, Charlie.
2, Orr & Lillico, Galt, Sambo, Tom, Bill.
5, H. Parkes, Woodstock, Jim, Dick, Harry.

Three Ewes, under 1 year. Eight entries.

1, Jno. Kelly, Shakspeare.
2, A. & W. Whitelaw, Guelph, Sally Aunison, Sally White, Pretty Biddy.
3, Jno. Hoggard, Ranelagh, Hoggard's Peggy, Juma, Mary.
Highly commended—D. H. Taylor, Conohin, Dolly ; sire, Jumbo W. 4001 ; dam, Grace Darling. Eva Taylor; sire, Balfour, M P. 1146; dam Boasy Mason, 2431. Neva ; sire, Balfour, M.P. 1146 ; dam, Rosy, 2420.

Dressed Carcass—Wether—1 year and under 2. Four entries.

1, Orr & Lillico, Galt, Jack.
2, Jno Kelly, Shakespeare.
3, Jno Kelly, Shakespeare.

Dressed Carcass—Wether—under 1 year. Four entries.

1, H. Parkes, Woodstock, Dick.
2, H. Parkes, Woodstock, Jim.
3, Orr & Lillico, Galt.

OXFORDS.

Ewe, under 1 year. Nine entries.

1, Smith Evans, Gourock, Evans 417, 24004. Sire, Adderburg Clansman, 21701 ; dam, Evans 301, 19126.
2, K. Finlayson, Campbellton, Finlayson's Topsy, 23202. Sire, Kempsford Hero 8th, 16445 ; dam, Inverells 17, 14469
3, K. Finlayson, Campbellton, Finlayson's Susy. Sire, Kempsford Hero 8th, 16445 ; dam, Achmore Lady 2, 8262.
Highly commended—J H. Jull, Mt. Vernon, Brant's Queen, 24729. Sire, King Langley of Brant, 17512, dam. Brant Queen 121, 18062.
Commended—K. Finlayson, Campbellton, Finlayson's Black Rose. Sire, Kempsford Hero 8th, 16445 : 17512 ; dam, Inverells 20, 14471.

Wether, 1 year and under 2. Three entries.

1, J. H. Jull, Mt. Vernon, Linden's Sir Kenneth 7, 23148. Sire, Hampton Duke, 16440 ; dam, Linden's Beauty 4th, 14919.
2, J. H. Jull, Mt Vernon, Linden's Sir Kenneth 8. 23149. Sire, Hampton Duke, 16440; dam, Linden's Beauty 2nd, 13051.
3, S. Evans, Gonrock, Evans' 402, 22205. Sire, Evans 352, 18403 ; dam, Lily of Gourock, 10760.

Wether, under 1 year. Five entries.

1, S. Evans, Gourock, Evans' 445, 24768. Sire, Evans' 357, 18403 ; dam, Sadie 9th of Gourock, 8871.
2, S. Evans, Gourock, Evans' 443, 24470. Sire, Evans' 357, 18403; dam Sadie 14th of Gourock, 8881.
3, J. H Jull, Mt. Vernon, Brant Boy 1. Sire, Linden's Jack, 19107 ; dam, Maggie Bess, 5379.
Highly commended—S. Evans, Gourock, Evans' 442, 24769 Sire, Evans' 357, 18403 ; dam, Sadie 14th of Gourock 8884.
Commended—J. H. Jull, Mt. Vernon, Brant Boy 2nd. Sire, Brant's King Langley, 17512 ; dam, Brant Queen, 18439.

Three Wethers, under 1 year. Two entries.

1, S. Evans, Gourock, Evans' 442, 443, and 445.
2, J. H. Jull, Mt. Vernon, Brant Boy 3, Brant's King Laugley, 17512 ; Sylvan Lady, 7622.

Three Ewes, under 1 year. Four entries.

1, K. Finlayson, Campbellton
2, S. Evans, Gourock, Evans' 417, 416, 426.
3, J. H. Jull, Mt. Vernon, Barbaree 15, 24400 ; Arkell. 21021 ; Ross 127, 17486.
Highly commended—S. Barberee, Nassagaweya, Evans' 438, 24667 ; 444, 24003 ; Barbarree 22.

Dressed Carcass—Wether, 1 year and under 2. Two entries.

1. S. Evans, Gourock.
2. J. H. Jull, Mt. Vernon.

Dressed Carcass—Wether, under 1 year. Two entries.

1. J. H. Jull, Mt. Vernon.
2. S. Evans, Gourock.

SHROPSHIRES.

Ewe, under 1 year. Six entries.

1. Jno. Campbell, Woodville, Campbell's 1079, 160406.
2. Jno. Campbell, Woodville, Campbell's 1100, 160424.
3. Geo. B. Phin, Hespeler, Geo. B. Phin's 812, 160426. Sire, Miller's 4222, 128502; dam, J. P. P.'s 544, 94003.

Highly commended—Geo. P. Phir, Hespeler, Geo. B. Phin's 813. Sire, Miller's 4222, 128502; dam, J. P. P.'s 531, 88409.

Commended—T. Lloyd, Jones & Sons, Burford, Lloyd Jones 180, 160275.

Wether, 1 year and under 2 Ten entries.

1. R. Gibson, Delaware, Knocker Out, 149941. Sire Martinet, 116685; dam, Gibson's 419, 94170.
2. Jno. Campbell, Woodville, The General 966 143737.
3. W. E. Wright, Glanworth, Wright's 357, 149501. Sire, Waltie, 115142; dam, Davis.

Highly commended—W. E. Wright, Glanworth, Wright's 380, 149972. Sire, Waltie, 115142; Dam, Davis 2nd, 60573.

Commended—T. Lloyd Jones & Sons, Burford, Lloyd Jones, 141, 149952. Sire, Lloyd Jones 116, 135550.

Wether, under 1 year. Ten entries.

1. R. Gibson, Delaware, Gibson's 695. Sire, Julius Caesar, 128421; dam, Gibson's 430, 95984.
2. R. Gibson, Delaware, Gibson's 708. Sire, Jupiter, 128421; dam, Gibson's 490, 113092.
3. Jno. Campbell, Woodville, Hopeful 2, 1119, 164590.

Highly commended—Jno. Campbell, Woodville, Viscount 2, 1120, 164591.

Commended—W. E. Wright, Glanworth, Wright's 408, 165070. Sire, McFarlane's 532, 148354; dam, Wright's 320, 149498.

Three Wethers, under 1 year. Six entries.

1. R. Gibson, Delaware.
2. Jno. Campbell, Woodville, Hopeful 2, 1119; Valiant 1110, 163952; and Viscount 2, 1120, 164591.
3. W. E. Wright, Glanworth, McFarlane's 408, 165070; 409, 165075; and 410, 165076.

Three Ewes, under 1 year. Four entries.

1. Jno. Campbell, Woodville. Campbell's 1100; 1078, 168405; and 1079.
2. Geo. B Phin, Hespeler.
3. W. E. Wright, Glanworth, McFarlane's 621, 163404; 650, 163405; Wright's 381, 161375.

Highly commended—Thos. Lloyd-Jones & Jons, Burford.

Dressed Carcass—Wether, 1 year and under 2. Eight entries.

1. W. H. Beattie, Wilton Grove, Pierce's 150.
2. W. E. Wright, Glanworth.
3. T. Lloyd-Jones & Sons, Burford.

Wether, dressed carcass under one year. Eight entries.

1. W. E. Wright, Glanworth.
2. W. E. Wright, Glanworth.
3. R. Gibson, Delaware.

SOUTHDOWNS.

Ewe, under 1 year. Fourteen entries.

1. Jno. Jackson & Son, Abingdon, Jackson 5C, 14490. Sire, Easter Lad, 12096; dam, Jackson 89B, 13070.
2. Jno. Jackson & Son, Abingdon, Jackson 3C, 14488. Sire, Easter Lad, 12096; dam, Jackson 68B, 11145.
3. Wm. Martin, Binbrook, Martin 52A, 14329. Sire, Jackson 4, 10246; dam, Martin's 75, 11134.

Highly commended—Wm. Martin, Binbrook, Martin 50A, 14327. Sire, Jackson 4, 10246; dam, Simington 46, 8307.

Commended—T. C. Douglass, Galt, Douglass Ewe 140, 14528. Sire, Hobgen's Galt, 14034; dam, Lady Count 3, 5961.

Wether, 1 year and under 2. Twelve entries.

1. Telfer Bros., Paris, Telfer 6, 15093. Sire, Telfer 15, 11050. Dam, Telfer ewe 62, 8475.
2. W. H. Beattie, Wilton Grove, Wilton 13943. Sire, Stanstead 2nd, 7281; dam, Violet 2nd, 10936.
3. T. C. Douglass, Galt, X 10. Sire, Chichester King 2, 9427; dam, Douglass Ewe 92, 10457.

Highly commended—T. C. Douglass, Galt, X 1, 15066. Sire, Chichester King 2nd, 9427; dam, Douglass Ewe 69, 9401.

Commended—Jno. Jackson & Son, Abingdon, Jackson 63. Sire, Easter Lad, 12096; dam, Jackson 92A, 8367.

Wether, under 1 year. Fifteen entries.

1. Telfer Bros., Paris, Telfer 2nd, 15089. Sire, Chichester King, 12875; dam, Telfer 30, 5740.
2. T. C. Douglass, Galt, X 20. Sire, Hobgen's Galt, 14034; dam, Douglass Ewe 103, 11590.
3. T. C. Douglass, Galt, X 2, 15067. Sire, Hobgen's Galt, 14034; dam, Douglass Ewe 100, 11587.

Highly commended—Wm. Martin, Binbrook, Martin 6, 15115. Sire, Jackson 45, 12199; dam, Martin 83 11654.

Commended—Wm. Martin, Binbrook, Martin 7, 15116. Sire, Jackson, 45, 12199; dam, Martin, 8383.

Three Wethers, under 1 year. Six entries.

1. T. C. Douglass, Galt, X2, X20 and X30.
2. Telfer Bros., Paris, Telfer 2, 3 and 4.
3. Wm. Martin, Binbrook.

Highly commended—Jno. Jackson & Son, Abingdon. Jackson 90, 96 and 97.

Commended—R. McEwen, Byron. McEwen wether 72, 73 and 71, 15166.

Three Ewes, under 1 year. Seven entries.

1. Jno. Jackson & Son, Abingdon. Jackson 5C, 14490; 3C, 14488; 6C, 14491.
2. Wm. Martin, Binbrook.
3. T. C. Douglass, Galt. Douglass ewe 138, 140, and 141, 14529.

Dressed Carcass—Wether, 1 year and under 2. Nine entries

1. W. E. Wright, Glanworth.
2. T. C. Douglass, Galt, X10.
3. Jno. Jackson & Son, Abingdon. Jackson 63.

Dressed Carcass—Wether, under 1 year. Eight entries.

1. T. Lloyd-Jones & Son, Burford.
2. Wm. Martin, Binbrook.
3. Jno. Jackson & Son, Abingdon.

DORSET HORNS AND MERINOS.

Ewe, under 1 year Four entries.

1. R. H. Harding, Thorndale. Harding's 172, 2250. Sire, Sir Charles, 1518; dam, Harding's 87, 350.
2. R. H. Harding, Thorndale. Harding's 165, 2249. Sire, Lord Roberts, 1333; dam, McLee's 38, 1483.
3. Jno. Hunter, Wyoming. Hunter's 24, 756. Sire, Bowman's 3, 373; dam, Crumple, 513.

Highly commended—Jno. Hunter, Wyoming. Hunter's 25, 757. Sire, Bowman's 3, 373; dam, Crumple, 513.

Dorset Horn or Merino wether, 1 year and under 2. Five entries.

1. R. H. Harding, Thorndale.
2. Jno. Hunter, Wyoming, Little Harry. Sire, Bowman's 3, 573; dam, Susie A., 433.
3. R. H. Harding, Thorndale.

Highly commended—Jno. Hunter, Wyoming, Burs. Sire, Bowman's 3, 573; dam, Marjorie, 650.

Wether, under 1 year. Four entries.

1. R. H. Harding, Thorndale. Sire, Lord Roberts, 1333; dam, Harding's 22, 325.
2. Jno. Hunter, Wyoming, Bowman. Sire, Bowman 3, 573; dam, Maid Marian, 649.
3. Jno. Hunter, Wyoming, Mebus. Sire, Mebus 3, 691; dam, Dorothy, 646.

Highly commended—R. H. Harding, Thorndale. Sire, Lord Roberts, 1333; dam, Harding's 22, 325.

Dressed Carcass—Wether, 1 year and under 2. Five entries.

1. R. Harding, Thorndale.
2. Jno. Hunter, Wyoming.
3. R. H. Harding, Thorndale.

Dressed Carcass—Wether, under 1 year. Three entries.

1. R. H. Harding, Thorndale.
2. Jno. Hunter, Wyoming.
3. Jno. Hunter, Wyoming.

HAMPSHIRE OR SUFFOLK.

Ewe, under 1 year. Four entries.

1. Telfer Bros., Paris, Cochran 145, 7500. Sire, Hillhurst, 2589; dam, Cochran 58, 7205.
2. Jno. Kelly, Shakespeare, 7218
3. Jno. Kelly, Shakespeare, 7217.

Highly commended—James Bowman, Guelph. Bowman's 35, 565. Sire, Bowman's 99, 423; dam, O. A. C. 283.

Wether, 1 year and under 2. Two entries.

1. Jas. Bowman, Guelph. Sire, Abel, 237; dam, Thompson's 13, 354.
2. Jas. Bowman, Guelph. Sire, Abel, 237; dam, Thompson's 14, 355.

Wether, under 1 year. Three entries.

1. Jas. Bowman, Guelph. Bowman's 33. Sire, Bowman's 99, 423; dam, O.A.C. 442.
2. Jas. Bowman, Guelph. Bowman's 30. Sire, Bowman 99, 423; dam, O.A.C. 282.
3. Jas. Bowman, Guelph. Bowman's 29. Sire, Bowman 99, 423; dam, O.A.C. 282.

Dressed Carcass—Wether, 1 year and under 2. Two entries.

1. Jas Bowman, Guelph.
2. Jas. Bowman, Guelph.

Dressed Carcass—Wether, under 1 year. Two entries.

1. Jas. Bowman, Guelph.
2. Jas. Bowman, Guelph.

SHROPSHIRE SPECIALS.

The prizes offered by the American Shropshire Record Association.

Best registered Wether, 1 year and under 2. Eleven entries.

1. R. Gibson, Delaware, 149492.
2. Jno. Campbell, Woodville, 145189.
3. W. E. Wright, Glanworth, 149972.

Best registered Wether, under 1 year. Eleven entries.

1. R. Gibson, Delaware, 165592.
2. R. Gibson, Delaware, 165593.
3. Jno. Campbell, Woodville, 164590.

Three registered Wether Lambs. Five entries.

1. R. Gibson, Delaware, 165592, 165595, 165593.
2. Jno Campbell, Woodville, 163952, 164590, 164591.
3. W. E. Wright, Glanworth, 165076, 165075, 165070.

Best Wether, sired by registered Ram out of grade Ewe, 1 year old. Nine entries.

1. Jno. Campbell, Woodville.
2. Jno. Campbell, Woodville.
3. T. Lloyd-Jones & Sons, Burford.

Grade Wether Lamb. Eight entries.

1. Jno. Campbell, Woodville.
2. Jno. Campbell, Woodville.
3. Jno. Campbell, Woodville.

LEICESTER SPECIALS.

Prizes offered by the American Leicester Breeders' Association.

Three Ewe Lambs. Eight entries.

1. Jno. Hoggard, Ranelagh.
2. J. & W. B. Watt, Salem
3. D. H. Taylor, Corwhin.

SOUTHDOWN SPECIALS.

Prizes offered by the American Southdown Breeders' Association.

Wether, 1 year old and under 2 Ten entries.

1. Telfer Bros., Paris.
2. W. H. Beattie, Wilton Grove, Wilton.

Wether, under 1 year. Eight entries.

1. Telfer Bros., Paris.
2. T. C. Douglas, Galt, X 2.

Three Ewe Lambs. Eight entries.

1. Jno. Jackson & Son, Abingdon. Jackson 2C, 3C, 6C.
2. Wm. Martin, Binbrook.

COTSWOLD SPECIALS.

Prizes offered by American Cotswold Record.

Three Cotswold Wether Lambs. Two entries.

1. Jno. Rawlings, Ravenswood. Rawlings 581, 580, and Milnes 87.

OXFORD SPECIALS.

Prizes offered by American Oxford-down Record Association.

Yearling Oxford Wether. Three entries

1. J. H. Jull, Mt. Vernon.
2. J. H. Jull, Mt. Vernon.

Lamb Wether. Four entries.

1. S. Evans, Gourock. Evans 445.
2. S. Evans, Gourock. Evans 442.

Ewe Lamb. Seven entries.

1. S. Evans, Gourock. Evans 417.
2. K. Finlayson, Campbellton.

Pen of three Wether Lambs. Two entries.

1. S. Evans, Gourock.
2. J. H. Jull, Mt. Vernon.

Pen of three Ewe Lambs Four entries.

1. K. Finlayson, Campbellton.
2. S. Evans, Gourock.

Yearling Wether Carcass. Two entries.

1. S. Evans, Gourock. Evans 402.

Lamb Wether Carcass. Two entries.

1. J. H. Jull, Mt. Vernon.

GRADE OR CROSS.

Ewe, 1 year and under 2. Eight entries.

1. Jno. Campbell, Woodville. Grade.
2. E. Brien & Sons, Ridgetown. Fan, Joe, 19968.
3. J. T. Gibson, Denfield.

Wether, 1 year and under 2. Nineteen entries.

1. Jno. Campbell, Woodville. Sire, Fairview Sort, 99519.
2. Jno. Campbell, Woodville. Sire, Fairview Sort, 99519.
3. R. Gibson, Delaware, Governor. Sire, Gamester, 89084.

Highly commended—W. E. Wright, Glanworth.

Three Grade or Cross Wethers, under 1 year. Twelve entries.

1. Jno. Campbell, Woodville.
2. R. Gibson, Delaware.
3. Orr & Lillico, Galt.

Highly commended—T. C. Douglass, Galt.

Commended—T. Lloyd-Jones & Sons, Burford. L. J., 5, 6, 7.

Wether, under 1 year. Twenty-five entries..

1. Jno. Campbell, Woodville. Sire, Campbell's Stamp, 153086.
2. And. Richardson, Peepabun. Ned.
3. R. Gibson, Delaware. Fatback. Sire, Hello, 105219

Highly commended—Jno. Campbell, Woodville. Sire, Campbell's Stamp, 153086.

Commended—Jno. Campbell, Woodville. Sire, Chief Secretary, 116700.

Ewe, under 1 year. Sixteen entries.

1. Hastings Bros.
2. Jno. Campbell, Woodville. Shropshire and Grade Cotswold.
3. And. Richardson, Peepabun. Lulu.

Highly Commended—Jno. Campbell, Woodville. Shropshire and Grade Cotswold.

Commended—G. Walker, Ilderton. Gertie.

Ewe or Wether, under 2 years. Nine entries.

1. Jno. Campbell, Woodville.

Highly commended—Jno. Campbell, Woodville.

Dressed Carcass, Wether, 1 year and under 2. Eleven entries.

1. Jno. Park & Son, Burgessville.
2. T. C. Douglass, Galt.
3. R. Gibson, Delaware.

Dressed Carcass, Wether, under 1 year. Fifteen entries.

1. Jno. Brown, Galt.
2. R. Gibson, Delaware.
3. W. E. Wright, Glanworth.

SWINE.

BERKSHIRES.

Barrow 6 months and under 9. Eight entries.

1. Snell & Lyons, Snelgrove, Paul. Sire, Colonel Brant, 5950; dam, Lady Snelgrove, 6596.
2. Geo. Green, Fairview, Windsor Lad. Sire, Golden King 1st, 7755; dam, Highclere Maid, 6351.
3. Durham & Caven, East Toronto, York Lodge Longshot. Sire, Baron Lee, 5779; dam, Riverside Beauty, 5781.

Highly commended—Snell & Lyons, Snelgrove, Bobs. Sire, Colonel Brant, 5950; dam, Lady Snelgrove, 6596.

Barrow, under 6 months. Ten entries.

1. Durham & Caven, East Toronto, York Lodge Bacon. Sire, Lord Windsor 2nd, 8117; dam, C. Matchless, 9030.
2. Snell & Lyons, Snelgrove, Sir Richard. Sire, Gallant Prince, 7691; dam, Lady Maid, 8185.
3. Snell & Lyons, Snelgrove, McKinley. Sire, Gallant Prince, 7691; dam, Lady Maid, 8185.

Highly commended—Wm. Wilson, Snelgrove, Adam. Sire, Longfellow 10, 8633; dam, Willow Lodge Allie, 9424.

Commended—Snell & Lyons, Snelgrove, Albert. Sire, Gallant Prince, 7691; dam, Lady Maid, 8185.

Sow 9 months and under 15. Six entries.

1. Geo. Green, Fairview, Highclere Sissy, 9059. Sire, Golden King, 6201; dam, Highclere Maid, 6351.
2. Jno. Kitching, Corwhin, Corwhin Lass, 8838. Sire, Corrector, 8549; dam, Barber Girl, 7976.
3. Wm. Wilson, Snelgrove, Willow Lodge Bertie, 9425. Sire, Dictator, 5944.

Highly commended—Jno. Kitching, Corwhin, Brantford Maid, 8901. Sire, Court Martyr, 97710; dam, Norval Girl, 6411.

Commended—Geo. Green, Fairview, Snelgrove Queen, 8888. Sire, Colonel Otter, 7690; dam, Belle of Milton, 5020.

Sow, 6 months and under 9. Twelve entries.

1. Wm. Wilson, Snelgrove, Willow Lodge Isabell, 9427. Sire, Colonel Otter, 7690; dam, Belle of Milton, 5020.
2. Geo. Green, Fairview, Lady Lee, 9460; Sire, Golden King, 7758; dam, Highclere Maid, 6351.
3. Snell & Lyons, Snelgrove, Lady Coates, 9420. Sire, Colonel Brant, 5950; dam, Lady Shields, 7697.

Highly commended—Durham & Caven, East Toronto, York Lodge Holy Rood, 90440 Sire, Lord Windsor, 8117; dam, Holy Rood, xl, 8025.

Commended—Geo. Green, Fairview, Lady Lee 2nd, 9472. Sire, Golden King 1st, 7758; dam, Highclere Maid, 6351.

Sow under 6 months. Thirteen entries.

1. Geo Green, Fairview, Golden Queen 2nd, 9459. Sire, Lord Curzon; dam, Golden Drop, 7376.
2. Snell & Lyons, Snelgrove, Norval Lady, 9421. Sire, Gallant Prince, 7691; dam, Lady Maid, 8185.
3. Snell & Lyons, Snelgrove, Sweet Mary, 9422. Sire, Gallant Prince, 7691; dam, Pleasant Maid, 8184

Highly commended—Durham & Caven, East Toronto, York Lodge Queen 1st, 9451 Sire, Lord Windsor, 8117; dam, Elphich's Matchless, 9030.

Commended—Geo. Green, Fairview, Golden Queen, 9458. Sire, Lord Curzon; dam, Golden Drop, 7376.

Three pigs, offspring of one sow, bred by exhibitor. Eight entries.

1. Geo. Green, Fairview.
2. Snell & Lyons, Snelgrove.

Highly commended—Snell & Lyons, Snelgrove.

Commended—Durham & Caven, East Toronto.

YORKSHIRES.

Barrow, 6 months and under 9. Five entries.

1. J. E. Brethour, Burford, Oak Lodge Frederick. Sire, Oak Lodge Fred, 6813; dam, Duchess Emigrant 6th, 6811.
2. R. J. Kerr, Mimosa, Maplehurst Swell 5th. Sire, Oak Lodge Charmer 2, 2885; dam, Oak Lodge Pride 8, 3779.
3. Colin Campbell, Guelph, Prince. Sire, College Swell, 4775; dam, Paisley Block Daisy, 5350.

Barrow, under 6 months. Seven entries.

1. H. Dedels, Breslaw, Brickly. Sire, Brickly Chief, 5355; dam, Look at Me, 4506.
2. H. J. Davis, Woodstock, Woodstock Judge. Sire, O. L. British Hero, 3511; dam, Lady Minto, 3280.
3. J. Featherston, Streetsville, Botterford Jack. Sire, Whiston Star, 3689; dam, Botterford Maid, 6414.

Highly commended—H. Dedels, Breslaw, Tom. Sire, Brickly Chief, 5355; dam, Look at Me, 4506.

Commended—J. Featherston, Streetsville, Botterford John. Sire, Whiston Star, 3689; dam, Botterford Maid, 6414.

Sow, 9 months and under 15. Four entries.

1. J. E. Brethour, Burford, L. Clara 20, 6578. Sire, Oak Lodge Royal King, 3044 ; dam, Oak Lodge Clara 12, 3136.
2. J. Featherston & Son, Streetsville, Pine Grove Blossom, 7488 Sire, Brittania Wonder, 3028 ; dam, May Beauty, 3271.
3. Jos. Featherston & Son, Streetsville, Pine Grove Nell, 7588. Sire, O. L. Swell 3rd, 3565 ; dam, Whiston Maid, 3673.

Highly commended—J. E. Brethour, Burford, D. L. Countess 8, 7397. Sire, Ruddington Lad, 3572 ; dam, Oak Lodge Countess, 3053.

Sow, 6 months and under 9. Eleven entries.

1. J. E. Brethour, Burford, Oak Lodge Clara 23, 6581. Sire, Oak Lodge Conqueror, 2475 ; dam Oak Lodge Clara 12, 3136.
2. J. E. Brethour, Burford, Oak Lodge Pride 17, 7402. Sire, Oak Lodge Conqueror, 2475 ; dam, Oak Lodge Pride 5, 3095.
3. H. J. Davis, Woodstock, Woodstock Countess. Sire, O. L. Regent 3755 ; dam, Woodstock, 3837.

Highly commended—H. J. Davis, Woodstock, Woodstock Lass. Sire, O. L. British Hero, 3511 ; dam, Lady Minto, 3280.

Commended—J. E. Brethour, Burford, Oak Lodge Pride 18, 7403. Sire, Oak Lodge Conqueror 2475 ; dam, Oak Lodge Pride 5, 3095.

Sow, under 6 months. Twelve entries.

1. H. Dedels, Breslau, Pet, 7361. Sire, Brickly Chief, 5355 ; dam, Look at Me, 4506.
2. J. E. Brethour, Burford, Oak Lodge Cinderella 72, 7392. Sire, Oak Lodge Conqueror, 2475 ; dam, Oak Lodge Cinderella, 30, 3686.
3. J. E. Brethour, Burford, Oak Lodge Cinderella 73, 7393. Sire, Oak Lodge Conqueror, 2475 ; dam, Oak Lodge Cinderella, 30, 3868.

Highly commended—H. Dedels, Breslau, Sisa, 7363. Sire, Brickly Chief, 5355 ; dam, Look at Me, 4506.

Commended—H. Dedels, Breslau, Sarah Jane, 7362. Sire, Brickly Chief, 5355 ; dam, Look at Me, 4506.

Three pigs, offspring of one sow, bred by exhibitor Six entries.

1. J. E. Brethour, Burford.
2. H. Dedels, Breslau.

Highly commended—H. J. Davis, Woodstock.

Commended—Jos. Featherston, Streetsville.

CHESTER.—WHITES.

Barrow, 6 months and under 9. Four entries.

1. Bennett & Pardo, Charing Cross, Bob. Sire, Jubilee Chief, 860 ; dam, Found at Last, 1295.
2. Bennett & Pardo, Charing Cross, Sam. Sire, Jubilee Chief, 860 ; dam, Found at Last, 1295.
3. D. DeCourcy, Bornholm, Tom. Sire, Cronje, 1481 ; dam, Annie, 1699.

Barrow, under 6 months. Six entries.

1. D. DeCourcy, Bornholm, Ned. Sire, American King, 1097 ; dam, Canada's Best, 834.
2. Bennett & Pardo, Charing Cross, Ben. Sire, London Sweepstake, 1650 ; dam, Grace, 1042.
3. Bennett & Pardo, Charing Cross, Harry. Sire, London Sweepstake, 1650 ; dam, Grace, 1042.

Highly commended—Bennett & Pardo, Charing Cross, Punch. Sire, London Sweepstake, 1650 ; dam Grace, 1042.

Sow, 9 months and under 15. Four entries.

1. Bennett & Pardo, Charing Cross, Jessie. Sire, Jubilee Chief, 860 ; dam, Mabel, 1873.
2. Bennett & Pardo, Charing Cross, Fanny. Sire, Jubilee Chief, 860 ; dam, Mabel, 1873.
3. D. DeCourcy, Bornholm, Emma Goldman, 2038. Sire, American King, 1097 ; dam, Canada's Best, 834.

Highly commended—R. H. Harding, Thorndale, Duchess of York, 2012. Sire, Dandy, 1380 ; dam Nettie, 970.

Sow, 6 months and under 9. Eight entries.

1. Bennett & Pardo, Charing Cross, Silver May. Sire, Jubilee Chief, 860 ; dam, Mabel, 1873.
2. Bennett & Pardo, Charing Cross, Topsy. Sire Jubilee Chief, 860 ; dam, Found at Last, 1295.
3. D. DeCourcy, Bornholm, Long Mag, 2126. Sire, Cronje, 1481 ; dam, Annie, 1699.

Highly commended—D. DeCourcy, Bornholm, Long Nell, 2127. Sire, Cronje, 1481 ; dam, Annie, 1699.

Commended—Bennett & Pardo, Charing Cross, Dolly. Sire, Jubilee Chief, 860 ; dam, Found at Last, 1295.

Sow, under 6 months. Seven entries.

1. Bennett & Pardo, Charing Cross, Bird. Sire, London Sweepstake, 1650 ; dam, Grace, 1042.
2. Bennett & Pardo, Charing Cross, Nell. Sire, London Sweepstake, 1650 ; dam, Grace, 1042.
3. D. DeCourcy, Bornholm, Queen Bess, 2128. Sire, American King, 1097 ; dam, Canada's Best, 834.

Highly commended—Bennett & Pardo, Charing Cross, Vido. Sire, London Sweepstake, 1650 ; dam, Grace, 1042.

Commended—Jos. Silverthorn, Scotland, Daisy 3rd, 2130. Sire, Long Tom, 1739 ; dam, Anna Lee, 1034.

Three pigs, offspring of one sow, bred by exhibitor. Five entries.

1. Bennett & Pardo, Charing Cross.
2. D. DeCourcy, Bornholm.
Highly commended—Bennett & Pardo, Charing Cross.
Commended—W. E. Wright, Glanworth.

POLAND CHINAS.

Barrow, 6 months and under 9. Three entries.

1. R. L. Smyth, Fargo, Ben. Sire, Corwin Ranger, 1065 ; dam, Mollie, 1064.
3. R. L. Smyth, Fargo, Joe. Sire, Corwin Ranger, 1065 ; dam, Mollie, 1064.
3. W. M. Smith, Scotland, Jim. Sire, Oxford Lad, 1475 ; dam, Fairfield Queen, 1474.

Barrow, under 6 months. Five entries.

1. Robt. L. Smyth, Fargo, Rob Roy. Sire Corwin Ranger, 1065 ; dam, Blackmore Beauty, 1517.
2. Robt. L. Smyth, Fargo, Gilroy. Sire, Corwin Ranger, 1065 ; dam, Blackmore Beauty, 1517.
3. Robt. L. Smyth, Fargo, Sandy Sire, Corwin Ranger, 1065 ; dam, Blackmore Beauty, 1517.
Highly commended—W. M. Smith, Scotland, Jack. Sire, Oxford Lad, 1475 ; dam, Fairfield Annie, 1505.
Commended—W. M. Smith, Scotland, Pat. Sire, Oxford Lad, 1475 ; dam, Fairfield Annie, 1505.

Sow, 9 months and under 15. Five entries.

1. Robt. L. Smyth, Fargo, Maud, 1609. Sire Corwin Ranger, 1065 ; dam, Dorothy, 856.
2. W. M. Smith, Scotland, Lassie, 1544. Sire, Oxford Lad, 1475 ; dam, Fairfield Queen, 1474.
3. Robt. L. Smyth, Fargo, Lengthy, 1606. Sire, Corwin Ranger, 1065 ; dam, Blackmore Beauty, 1517.
Highly commended—W. M. Smith, Scotland, Missie, 1545. Sire, Oxford Lad, 1475 ; dam, Fairfield Queen, 1474.

Sow, 6 months and under 9. Four entries.

1. Robt. L. Smyth, Fargo, Phoebe, 1608. Sire, Corwin Ranger, 1065 ; dam, Mollie, 1064.
2. W. M. Smith, Scotland, Canadian Heroine, 1555. Sire, Oxford Lad, 1475 ; dam, Fairfield Queen, 1474.
3. W. M. Smith, Scotland, Canadian Lina. Sire, Oxford Lad, 1475 ; dam, Fairfield Queen, 1474.

Sow, under 6 months. Seven entries.

1. Robt. L. Smyth, Fargo, Roy, 1607. Sire, Corwin Ranger, 1065 ; dam, Blackmore Beauty, 1517.
2. Robt. L. Smyth, Fargo, Beauty 2nd, 1604. Sire, Corwin Ranger, 1065 ; dam, Blackmore Beauty, 1517.
3. Robt. L. Smyth, Fargo, Beauty 3rd, 1605. Sire, Corwin Ranger, 1065 ; dam, Blackmore Beauty, 1517.
Highly commended—W. M. Smith, Scotland, Scotland Joan, 1599 Sire, Oxford Lad, 1475 ; dam, Fairfield Anni , 1505.
Commended—W. M. Smith, Scotland, Scotland Annie, 1600. Sire, Oxford Lad, 1475 ; dam, Fairfield Annie, 1505.

Three pigs, offspring of one sow, bred by exhibitor. Three entries.

1. Robt. L. Smyth, Fargo.
2. W. M. Smith, Scotland.
Highly commended—W. M. Smith, Scotland.

ESSEX.

Barrow, 6 months and under 9. Three entries

1. T. A. McClure, Meadowvale, Daisy Billy. Sire, Paardeberg, 45 ; dam, Dark Lily, 41.
2. Jos. Featherston & Son, Streetsville, Paardeberg Maud. Sire, Paardeberg, 45 ; dam, Model Queen, 26.
3. Jos. Featherston & Son, Streetsville, Paardeberg Maud 2nd. Sire, Paardeberg, 45 ; dam, Model Queen, 26.

Barrow, under 6 months. Three entries.

1. Jos. Featherston & Soo, Streetsville, Black Bob. Sire, Paardeberg, 45 ; dam, Model Topsy, 36.
2. Jos Featherston, Streetsville, Black Ben. Sire, Paardeberg 45 ; dam, Model Topsy, 36.
3. T. A. McClure, Meadowvale, Daisy Tom. Sire, Paardeberg 45 ; dam, Daisy Maid, 40.

Sow, 9 months and under 15. Three entries.

1. Jos. Featherston & Son, Streetville, Topsy Toog, 68. Sire, Paardeberg, 45 ; dam, Model Topsy, 35.
2. T. A. McClure, Meadowvale, Daisy Belle, 61. Sire, Paardeberg, 45 ; dam, Daisy Maid, 40.
3. Jos. Featherston & Soo, Streetsville, Topsy Toog 2, 69. Sire, Paardeberg, 45 ; dam, Model Topsy, 36.

Sow, 6 months and under 9. Three entries.

1. T. A. McClure, Meadowvale, Daisy Lily, 63. Sire, Paardeberg, 45 ; dam, Dark Lily, 41
2. Jos. Featherston & Son, Streetsville, Black Queen, 64. Sire, Paardeberg, 45 ; dam, Model Queen, 26.
3. Jos. Featherston & Soo, Streetsville, Black Queen 2, 65. Sire, Paardeberg, 45 ; dam, Model Queen, 26.

Sow, under 6 months. Three entries.

1. T. A. McClure, Meadowvale, Daisy Bonicie, 62. Sire, Paardeberg, 45; dam, Daisy Maid, 40.
2. Jos. Featherston & Son, Streetsville, Topsy Jane, 66. Sire, Paardeberg, 45; dam, Model Topsy, 36.
3. Jos. Featherston & Son, Streetsville, Topsy Jane 2, 67. Sire, Paardeberg, 45; dam, Model Topsy, 36.

Three Pigs, offering of one sow, bred by exhibitor. Two entries.

1. Jos. Featherston & Son, Streetsville.
2. Jos. Featherston & Son, Streetsville.

TAMWORTHS.

Barrow, 6 months and under 9. Eight entries.

1. A. Elliott & Son, Galt, Bobs. Sire, Sahib, 1310; dam, Dumfries Belle, 1454.
2. D. Douglass & Son, Mitchell, Jack Sire, Defiance, 902; dam, Glamworth Maid, 1494.
3. John C. Nichol, Hubrey, Elliott. Sire, Chatham Hero, 1419; dam, Nellie, 1306.

Highly commended—W. M. Smith, Scotland, Tommy. Sire, Timothy, 1082; dam, Parasol, 1811.

Barrow, under 6 months. One entry.

1. A. Elliott & Son, Galt, Buller. Sire, Sahib, 1310; dam, Second Choice, 2026.

Sow, 9 months and under 15 Five entries

1. D. Douglass & Sons, Mitchell, Lady Amherst, 2134. Sire, Ralph, 949; dam, Glamworth Maid, 1494.
2. A. Elliott & Son, Galt, Fashion Plate, 2342. Sire, French, 2116.
2. John C. Nichol, Hubrey, Lady Alice, 2285. Sire, Chatham Hero, 1419; dam, Elmsdale Countess, 1779.

Highly commended—A. Elliott & Son, Galt, Belle's Beauty, 2513. Sire, Sahib, 1310; dam, Dumfries Belle, 1454.

Commended—Jno. C. Nichol, Hubrey, Maud 5th, 2270. Sire, Long Joe, 1422; dam, Maud 3, 1684.

Sow, 6 months and under 9. Six entries.

1. D. Douglas & Sons, Mitchell, Lady Minto, 2333. Sire, Defiance, 902; dam, Glanworth Maid, 1494.
2. John C. Nichol, Hubrey, Elmsdale Beauty, 2277. Sire, Long Joe, 1422; dam, Elmsdale Countess, 1779.
3. A. Elliott & Son, Galt, Ruberta, 2511. Sire, Advance, 610; dam, Minnie F., 721.

Highly Commended—Jno. C. Nichol, Hubrey, Elmdale Matchless, 2277. Sire, Long Joe, 1422; dam, Elmdale Countess, 1779.

Commended—D. Douglass & Son, Mitchell, Betsy, 2331. Sire, Defiance, 902; dam, Glanworth Maid, 1494.

Sow, under 6 months. Seven entries.

1. Wm. R. McDonald, Ridgetown, Minnie Lass. Sire, Botany Boy, 871; dam, Nut, 1176.
2. Wm. R. McDonald, Ridgetown, Minnie, 2447. Sire, Botany Boy, 871; dam, Nut, 1176
3. Wm. R. McDonald, Ridgetown, Minnie May, 2448. Sire, Botany Boy, 871; dam, Nut, 1176.

Highly commended—D. Douglass & Sons, Mitchell, Maggie, 2516. Sire, Defiance, 902; dam, Mitchell Daisy, 2104.

Commended—D. Douglass & Sons, Mitchell, Maud, 2517. Sire, Defiance, 902; dam, Mitchell Daisy, 4.

Three pigs, offspring of one sow, bred by exhibitor. Six entries.

1. D. Douglass & Sons, Mitchell.
2. A. Elliott & Son, Galt.

Highly commended—Jno. C. Nichol, Hubrey.

Commended—W. R. McDonald, Ridgetown.

DUROC JERSEYS.

Barrow, 6 months and under 9. Four entries.

1. W. N. Tape, Bentpath, Ned. Sire, Lord Milton, 339; dam, Jean 2, 419.
2. W. M. Smith, Scotland, Billy. Sire, Jimmy, 282; dam, Fairfield Maud, 390.
3. W. N. Tape, Bentpath, Bob. Sire, Lord Milton, 339; dam, Jean 2, 419.

Highly Commended—W. N. Tape, Bentpath, Bill. Sire, Lord Milton, 339; dam, Jean 2, 419.

Barrow, under 6 months. Three entries.

1. W. N. Tape, Bentpath, Tom. Sire, Kipling, 334; dam, Genevieve 2, 416.
2. W. N. Tape, Bentpath, Dick. Sire, Kipling, 334; dam, Genevieve 2, 416.
3. W. N. Tape, Bentpath, Harry. Sire, Kipling, 334; dam, Genevieve 2, 416.

Sow 9 months and under 15. Three entries.

1. W. M. Smith, Scotland, Scotland Lass, 468. Sire, Jimmy, 282; dam, Fairfield Maud, 390.
2. W. N. Tape, Bentpath, Maud, 459. Sire, Anglo-American, 343; dam, Janie, 155.
3. W. N. Tape, Bentpath, Lucy, 458. Sire, Anglo-American, 343; dam, Janie, 155.

Sow, 6 months and under 9. Four entries.

1. W. N. Tape, Bentpath, Princess of Lambton, 497. Sire, Lord Milton, 339; dam, Jean 2, 419.
2. W. N. Tape, Bentpath, Duchess of Lambton, 493. Sire, Lord Milton, 339; dam, Jean 2, 419.
3. W. M. Smith, Scotland, Scotland Queen, 471. Sire, Jimmy, 282; dam, Fairfield Maud, 390.

Sow, under 6 months. Six entries.

1. W. N. Tape, Bentpath, Bentpath Maid, 492. Sire, Kipling, 334; dam, Genevieve 2, 416.
2. W. M. Smith, Scotland, Scotland Duchess, 488. Sire, Pancake, 430; dam, Sweet Bacon, 431.
3. W. N. Tape, Bentpath, Pride of Dawn, 495. Sire, Kipling, 334; dam, Genevieve 2, 416.

Highly commended—W. M. Smith, Scotland, Scotland Duchess 2nd, 489. Sire, Pancake, 430; dam, Sweet Bacon, 431.

Commended—W. N. Tape, Bentpath, Pride of Lambton, 496. Sire, Kipling, 334; dam, Genevieve 3, 416.

Three pigs, offspring of one sow, bred by exhibitor. Four entries.

1. W. N. Tape, Bentpath.
2. W. M. Smith, Scotland.
3. W. N. Tape, Bentpath.

GRADES OR CROSSES.

Barrow, 6 months and under 9. Nine entries.

1. A. Elliott & Son, Galt, Mike.
2. Bennett & Pardo, Charing Cross.
3. W. M. Smith, Scotland.

Highly commended—Bennett & Pardo, Charing Cross.

Barrow, under 6 months. Eight entries.

1. Bennett & Pardo, Charing Cross.
2. Jno. Park & Son, Burgessville.
3. Jno. C. Nichol, Hubrey.

Highly commended—W. M. Smith, Scotland.

Commended—Bennett & Pardo, Charing Cross.

Sow, 6 months and under 9. Five entries.

1. A. Elliott & Son, Galt.
2. A. Elliott & Son, Galt.
3. Durham & Cavan, East Toronto.

Highly commended—Bennett & Pardo, Charing Cross.

Commended—Wm. Wilson, Snelgrove.

Sow, under 6 months. Nine entries.

1. A. Elliott & Son, Galt.
2. Jno. Park & Son, Burgessville.
3. Jno C. Nichol, Hubrey.

Highly commended—Jno. C. Nichol, Hubrey.

Commended—Bennett & Pardo, Charing Cross.

EXPORT BACON HOGS.

Three pure breds. Twenty-nine entries.

1. J. E. Brethour, Burford.
2. Jos. Featherston & Son, Streetsville.
3. J. E. Brethour, Burford.
4. J. R. Newell & Son, Crampton.
5. Snell & Lyons, Snelgrove.
6. H. Dedells, Breslau.
7. G. B. Hood, Guelph.
8. Jos. Featherston & Son, Streetsville.
9. Jno. C. Nichol, Hubrey.

Highly commended—Geo. Green, Fairview.

Commended—J. E. Brethour, Burford.

Three Grades or Crosses. Seventeen entries.

1. A. Elliott & Son, Galt.
2. Jno. Park & Son, Burgessville.
3. T. A. McClure, Meadowvale.
4. R. H. Harding, Thorndale.
5. Jas. Rettie, Norwich.

Highly commended—Jno. C. Nichol, Hubrey.
Commended—Bennett & Pardo, Charing Cross.

Three best hogs, any breed. Nineteen entries.

Prizes $50, donated by Canadian Packing Co., London.

1. J. E. Brethour, Burford.

Three hogs from the County of Wellington. Five entries.

Prize $10, donated by the Traders' Bank, Guelph.

1. D. Matheson, Coningsby.

DRESSED CARCASSES.

Three pure breds. Twenty entries.

1. J. E. Brethour, Burford.
2. Jos. Featherston & Son, Streetsville.
3. D. De Courcy, Bornholm.
4. J. R. Newell & Son, Crampton.
5. G. B. Hood, Guelph.
6. G. B. Hood, Guelph.
7. Durham & Cavan, East Toronto.
8. E. Brien & Sons, Ridgetown.
9. J. E. Brethour, Burford.

Dressed carcass, three Grades or Crosses. Fourteen entries.

1. Alf. Hales, Guelph.
2. T. A. McClure, Meadowvale.
3. John Park & Sons, Burgessville.
4. Jas. Rettie, Norwich.
5. C. R. Gies, Heidelberg.

Highly commended—A. Elliott & Son, Galt.
Commended—Bennett & Pardo, Charing Cross.

Three best swine carcasses, any breed. Sixteen entries.

1. Alf. Hales, Guelph.

Best pen of four bacon hogs, any breed, pure bred or Cross. Sixteen entries.

Prize $100, donated by Wm. Davies Packing Co., Toronto.

1. Jos. Featherston & Son, Streetsville.
2. J. E. Brethour, Burford

CONTRIBUTIONS BY PACKING COMPANIES.

The Pork Packing Factories of Ontario contributed $525 towards the Prize List, made up as follows:—

Bow Park Packing Company, Brantford	$ 50 00
Brantford Co-operative Company	50 00
Canadian Packing Company, London	50 00
Collingwood Packing Company	50 00
Ingersoll Packing Company	100 00
Palmerston Packing Company	25 00
Park, Blackwell Company, Toronto	50 00
Whyte Packing Company, Stratford	50 00
Wm. Davies Packing Company, Toronto	100 00
	$ 525 00

Cow's name, and address of owner.	Total pounds milk in 48 hours.	Total pounds fat.	Total pounds solids, not fat.	Total points for fat.	Total points for solids not fat.	Points for days in milk.	Aggregate points.	First test.					Second test.					Third Test.				
								Pounds milk.	Test per cent. fat.	Pounds fat.	Per cent. solids not fat	Pounds solids not fat.	Pounds milk.	Test per cent. fat.	Pounds fat.	Per cent. solids not fat.	Pounds solids not fat.	Pounds milk.	Test per cent. fat.	Pounds fat.	Per cent. solids not fat.	Pounds solids not fat.
SHORTHORN COW, 36 MONTHS AND OVER.																						
1. Bonnie Doon, 35018 L. D. Currie, Hillsburg.	106.6	3.809	9.17	76.18	36.68	.3	113.16	35.8	3.6	1.288	8.4	3.00	53.6	3.55	1.902	8.7	4 66	17.2	3.6	.619	8 8	1 51
2. Irish Ivy, 36816 A. W. Smith, Maple Lodge.	96.7	3.906	8 63	78.12	34.52	....	112.64	35.0	4.1	1.435	8.8	3.08	47.1	3.9	1.936	9 0	4.23	14.6	4.35	.635	9.1	1.32
3. Indian Rose, 25005 Jas. Brown, Norval.	113.6	3.511	9.82	70.22	39.28	. .	109 50	38.0	3 1	1.178	8 8	3.34	59.0	2.9	1.711	8.6	5.07	16.6	3.75	622	8 5	1.41
4. Jubilee's Julia, 23523 H. K. Fairbairn, Theuford.	89 4	3.129	8.08	62 58	32.32	.. .	94.90	29.8	3.45	1.028	9 1	2 71	44.3	3.45	1 528	9.0	3 98	15.3	3.75	.573	9 1	1.39
5. Golden Gem, 31958 H. K. Fairbairn, Theuford.	61.7	2.336	5.55	46 72	22.20	.9	69.82	20.8	3.7	.769	8 9	1.85	31.2	3.75	1.170	9 0	2.80	9.7	4.1	.397	9.3	.90
C.—Amelia Maud, 24022 Alex. McKinnon, Conirgsby.	43.4	1.737	3.88	34.74	15.52	....	50.26	16.1	3.55	.571	9.0	1.44	20.6	4.2	.865	8.9	1.83	6.7	4 5	301	9.2	.61
SHORTHORN HEIFER, UNDER 36 MONTHS																						
1. Belvedere 3rd, 35576 H. C. Graham, Aikn Craig	65 6	2.723	6.16	54.46	24.64	....	79.10	23 4	4 0	.936	9.4	2.19	29.5	3.65	1.076	9.4	2.77	12.7	5.6	.711	9.5	1.20
2. Juliet, 35301 H. K. Fairbairn, Theuford.	53.8	2.091	4.95	41 82	19.80	.9	62.52	16.6	3.5	.581	9 1	1.51	28 6	3.9	1.115	9.2	2.63	8.6	4.6	.395	9.5	.81
3. Lady Thorndale, Vol. xvi H. J. Davis, Woodstock.	28.8	1.065	2.74	21.30	10.96	....	32.26	9 6	3.8	.374	9.6	.92	14 5	3.6	.522	9 5	1.37	4.7	3.6	.169	9.6	.45
AYRSHIRE COW, 36 MONTHS AND OVER																						
1. Annette, 2193 W. M. Smith, Scotland.	79.1	3.677	7 70	73 54	30 80	9.1	113.44	26.5	4.6	1.219	9.6	2.54	39.5	4.7	1.856	9.8	3.83	13.1	4.6	.602	9.9	1.29
2. Nelly Grey, 2057 N. Dyment, Clappison.	102.1	3.800	8.66	76.00	34 64	.3	110.94	33.8	3.85	1.301	8.4	2.83	51.6	3.6	1.857	8 5	4.38	16.7	3.85	.642	8.7	1.45
3 Annie Laurie of Brookside, 3339 H. & J. McKee, Norwich.	101.8	3 488	8.89	69.36	35 56	....	104.92	34.1	3.25	1.108	8 7	2.96	50.4	3.45	1.738	8.7	4 38	17.3	3.6	.622	9.0	1.55
H.C.—Queen, 2227 N. Dyment, Clappison.	67.8	2.758	6.08	55.16	24.32	9.8	89 28	23.1	4 2	.970	9.0	3 07	33.6	4.0	1.344	9 0	3.02	11.1	4.0	.444	9.0	.99
C.—Briery Banks Susie, 2847 N. Dyment, Clappison.	81 8	2.868	6 81	57.36	27.24	3.5	88.10	26.2	3.2	.838	8 3	2.17	41 1	3.7	1 520	8.5	3.49	13 8	3.7	.510	8.4	1.15

AYRSHIRE HEIFER, UNDER 36 MONTHS.																							
1. Ladysmith, 11071 W. M. Smith, Scotland.	81 1	3.605	7.50	72.10	30.00	3.8	105.90	25.3	4.55	1.151	9.4	2.37	42.4	4 4	1 865	9.2	3.90	13.4	4.4	.589	9.2	1.23
2. White Rose, 13191 H. & J. McKee, Norwich.	78.7	3.122	7.26	62.44	29.04	1.0	92.48	27.1	4.1	1.111	9.3	2.52	38.5	3 9	1.501	9.2	3.54	13.1	3.9	.550	9.2	1.20
3. Ruby 2nd of Hickory Hill, 10446 N. Dyment, Clappison.	59.7	2.396	5.46	47.92	21.84	5.3	75.06	19 6	4.1	.803	9.3	1.82	30.0	4.0	1 200	9 1	2 73	10.1	3.9	.393	9.1	.91
H.C.—Lady White, 11072 W. M. Smith, Scotland.	56.7	2.287	5.23	45.74	20.92	6.6	73.26	19 2	4.1	.787	9.0	1.72	28.4	4.0	1.136	9.4	2.66	9 1	4 0	.364	9.4	.85
C.—Esoteric, 10321 W. M. Smith, Scotland.	44.8	1.784	4.25	35.68	17.00	8.4	61.88	15.0	4.0	.600	9.5	1.42	22.0	4 0	.88	9.5	2.09	7.8	3.9	.304	9.5	.74
HOLSTEIN COW, 36 MONTHS AND OVER.																							
1. Winnie Win, 2161 Geo. Rice, Currie's Crossing	119.4	4 078	10.91	81.56	43.64	.. .	125.20	40.6	3.4	1.380	9.1	3.69	59.5	3.4	2.023	9.2	5.47	19.3	3.5	675	9.1	1.75
2 Queen de Kol 2, 1819 G. W. Clemons, St. George.	87.2	2.674	7.41	53.48	29.64	9.9	93 02	29 6	3.0	.888	8.5	2.51	43.0	3.0	1.290	8.5	3 65	14 6	3.4	.436	8.6	1.25
3 Cornelia Artis, 565 G. W. Clemons, St. George.	74 6	2.222	6 19	44.44	24.76	4.7	73.90	26.5	2.9	.768	8.2	2.17	36.8	3.0	1.104	8.4	3.09	11.3	3.1	350	8 3	.93
HOLSTEIN HEIFER, UNDER 36 MONTHS.																							
1. Pauline Pietertje Clothilde Geo. Rice, Currie's Crossing.	92.8	3.477	8.69	69.54	34.76	....	104.30	30.6	4.1	1.254	9.5	2.90	46 6	3.6	1.677	9.3	4 33	16.6	3.5	.546	9.4	1.46
2. Mercena 3rd, 2511 Jas. Rettie, Norwich.	91.4	3 386	8.19	67.72	33.76	2.5	102.98	32.8	3.2	1 049	8.5	2.78	47 3	3.75	1.773	8.8	4.16	15.3	3.95	564	8.8	1 25
3. Cornelia Scuilings, 2713 Jas. Rettie, Norwich	71.5	3.494	6.87	69.88	27.48	....	97.36	25.3	4.75	1.201	9.0	2.27	36.1	4.65	1.678	9.4	3 39	13.1	4.7	.615	9.3	1.21
H.C.—Ianthe Jewel Med, 2708 Jas Rettie, Norwich.	76 8	2.889	6.74	57.78	26.96	6.4	91.14	26.3	3.85	1.012	8.8	2.31	38.5	3.8	1.463	8 8	3 38	12.0	3.45	.414	8.8	1.05
C.—Princess Pietertje de Kol, 2516 G. W. Clemons, St. George.	69.7	1.955	5.99	39.10	23.56	6.2	69.26	22.6	2.9	.655	8.7	1.96	35 6	2.8	.996	8.6	3.06	11.5	2 65	.304	8.5	.97
GRADE COW, 36 MONTHS AND OVER.																							
1. Utopia A. McDougall, Guelph.	106.3	4 463	9 54	89.26	38.16	....	127.42	36.0	4.2	1.512	9.0	3.24	51.9	4 2	2.179	8.9	4.61	18.4	4.2	.772	9.2	1.69
GRADE HEIFER, UNDER 36 MONTHS.																							
1 Nellie Jas. McCormack & Son, Rockton.	68.2	2.504	5.97	50.08	23.88	2.3	76.28	23.1	3.5	.808	8.7	2.00	34.6	3.75	1 297	8.8	3.04	10.5	3.8	.399	8.9	.93
2. Jennie W. M. Smith, Scotland.	53.1	2.116	5 08	42.22	20 32	10.0	72.61	19.0	4 0	.760	9.6	1.82	26.7	4.0	1.068	9.6	2.56	7.4	3.9	.288	9.5	.70
3. Mary A. McDougall, Guelph.	48.4	2.221	4 59	44.42	18.36	2.6	65 38	16.1	5.0	.805	9.5	1.52	23.9	4.4	1.051	9.5	2.27	8.4	4.35	.365	9.6	.80

ONTARIO PROVINCIAL WINTER FAIR, DECEMBER 8TH TO 12TH, 1902.

The annual meeting of the Ontario Provincial Winter Fair was held in the Palmer House, Toronto, on January 24th, at 7.30 p.m. The President, Mr. A. W. Smith, in the chair.

On motion of Wm. McNeil, seconded by John A. McGillivray, the financial statement was adopted.

OFFICERS.

President, - - - - -	A. W. Smith, Maple Lodge.
Vice-President, - - - - -	F. W. Hodson, Ottawa.
Secretary-Treasurer, - - -	A. P. Westervelt, Toronto, Ont.

Committees:

CATTLE.—A. W. Smith, Maple Lodge ; Henry Wade, Toronto ; Arthur Johnston, Greenwood ; G. W. Clemons, St. George ; John Bright, Myrtle ; A. F. H. Jones, Guelph ; J. M. Duff, Guelph ; John M. Tyson, Guelph ; John McCorkindale, Guelph ; G. C. Creelman, Toronto.

SHEEP.—Jas. Tolton, Walkerton , John Jackson, Abingdon ; A. W. Smith, Maple Lodge ; John A. McGillivray, Uxbridge ; J. M. Gardhouse, Highfield ; Jas. Miller, Guelph ; William Dryden, Brooklin ; John T. Gibson, Denfield.

SWINE.—William Jones, Mount Elgin ; G. B. Hood, Guelph ; Geo. Green, Fairview ; Prof. G. E. Day, Guelph ; Thos. Teasdale, Concord ; J. E. Brethour, Burford.

DAIRY.—Prof. G. E. Day, G. W. Clemons, Prof. H. H. Dean, R. G. Murphy, Elgin, Henry Wade.

POULTRY.—Wm. McNeil, London ; A. W. Tyson, Guelph ; F. W. Hodson, W. R. Graham, Allen Boag, London ; F. C. Hare, Ottawa.

RECEPTION.—Hon. John Dryden, F. W. Hodson, A. W. Smith, Dr. Jas. Mills, Mayor John Kennedy, A. F. H. Jones, J. M. Duff, Arthur Johnston.

Superintendent of Buildings : D. G. Hanmer, Mt. Vernon. Assistant-Superintendent ; J. H. Saunders, London.

Date of holding Show.

Moved by Arthur Johnston seconded by G. B. Hood, "That the date for holding the show will be the week following the week in which the Chicago show is held, but that the Executive have power to change the date should they consider it necessary." Carried.

Amendments to Rules and Prize List.

On page 11, clause 59, in the prize list, the wording, "breeder" was substituted for that of "feeder."

On page 17, class 11, the foot-note regarding export steers was amended thus : "Animals entered for the above must be owned and fed by the exhibitor for at least three months previous to the show, and will not be eligible to show in classes 1 to 5, both inclusive."

G. W. Clemons raised the objection that animals farrowed, the property of stockmen, would not be allowed to compete, and it was resolved :

"That the animals either be bred by or born in the possession of the exhibitor."

F. W. Hodson moved, seconded by Arthur Johnston, "That this rule be a general rule for pure bred classes." Carried.

Moved by G. B. Hood, seconded by Wm. Jones, "That in the grade classes all animals must have been owned and fed by the exhibitor for at least three months previous to the show." Carried.

It was also suggested that in class 11, (export steers) the premiums should be $40, $30, $20, and $10.

Moved by Major McGillivray, seconded by William Jones, "That Mr. J. E. Brethour and A. P. Westervelt be a committee to interview the pork packers with regard to prize money." Carried.

On motion of Prof. G. E. Day, seconded by Thos. Teasdale, it was resolved, "That all dressed carcasses be judged from the consumer's standpoint."

Dairy Department : Moved by G. W. Clemons, seconded by Prof. G. E. Day, "That at the next and following exhibitions, in the dairy class, the dairy test commence at 1 o'clock on Monday instead of Monday night as heretofore, and that the test continue for forty-eight hours therefrom." Carried.

Clause 50, page 11, was amended to read thus : "In the section for cows thirty-six months and over, a cow must make a total score of not less than 70 points, according to the scale, in order to be eligible for a first prize ; and a total score of not less than 50 points, according to the scale, in order to be eligible for any other prizes."

It was suggested that they should advertise the judging to be all done the first day.

Mr. J. E. Brethour suggested that the judges should state their reasons why they awarded the prizes to certain animals as it was the means of educating the breeders along the lines of judging.

On motion of F. W. Hodson, seconded by Arthur Johnston, it was resolved : "That the Executive Committee be instructed to draw out rules and regulations as governing the programme to be drawn out for judging, and it would then all rest with the exhibitors as to whether they got their animals in the ring or not."

On motion, it was resolved, "That the Secretary be instructed to send to the Old Country for a set of the large cards for announcing the classes to be judged, the same as are used at the Highland Society and Royal Shows."

Mr. J. E. Brethour suggested that where pigs had won first prizes the breeders be furnished with very large cards in order that they could be tacked up and seen by the public.

Mr. Hodson stated that at the Royal in England a veterinary goes through the show and examines all the animals in order to ascertain whether they are too old for the class they are showing in, and if so, he marks them "disqualified," and he thought it would be a good idea to have some similar test at the Provincial Winter Fair, as some times animals were really older than the classes they were entered in.

Mr. McGillivray thought it would be impossible to tell the age of very young swine.

Moved by Arthur Johnston, seconded by John A. McGillivray, "That the matter of deciding the ages of all animals, and the method of ascertaining their ages, be left in the hands of the Executive Committee.

Judging.

On motion of F. W. Hodson, seconded by John A. McGillivray, it was resolved, "That the judging begin at 1 o'clock on Tuesday instead of 3 o'clock as heretofore."

Printing and Advertising.

On motion, the printing and advertising was left in the hands of the Executive Committee.

Killing and Selling.

It was also resolved that the killing and selling of animals should be left in the hands of the Executive Committee.

Appointment of judges.

The matter of appointing judges was left in the hands of the Executive.

Admission Fees.

The Secretary stated that members of Farmers' Institutes were allowed free admission on their paying $5 for each hundred members, and $5 for each additional hundred, and as a great number came from some institutes he would suggest that the first hundred be $5, the second hundred say $10 or $20 or over, for every additional hundred or fraction thereof.

Moded by John A. McGillivray, seconded by Arthur Johnston, "That the suggestion of the Secretary with regard to admission to Farmers' Institutes be carried out." Carried.

The meeting then adjourned.

Third Annual Ontario

Provincial Auction Sales

OF

PURE BRED

Live Stock

WILL BE CONDUCTED UNDER
THE AUSPICES OF

The Dominion Cattle, Sheep and Swine Breeders' Associations

AT

POINTS IN ONTARIO, DURING FEBRUARY, 1903

SELECTED STOCK

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Parliament Buildings, TORONTO.

Ontario Provincial Winter Fair

A COMBINED EXHIBITION

OF

Fat Stock, Dairy Cattle, Live and Dressed Poultry

WILL BE HELD AT

GUELPH, ONT.

DECEMBER 8th to 12th, 1902

Every provision will be made for the convenience and comfort of visitors, exhibitors and their exhibits.

Practical lectures delivered on the following topics: **Beef Cattle, Dairy Cattle, Sheep, Bacon Hogs, Live Poultry, Dressed Poultry.**

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A. W. SMITH, President,
MAPLE LODGE, ONT.

A. P. WESTERVELT, Secretary,
PARLIAMENT BUILDINGS, TORONTO

REPORT

ON THE

ONTARIO EXHIBIT

OF

LIVE STOCK AND POULTRY

AT THE

PAN AMERICAN EXPOSITION

1901.

(APPENDIX TO THE REPORT OF THE LIVE STOCK ASSOCIATIONS.)

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.

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1902.

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ONTARIO LIVE STOCK AND POULTRY AT THE PAN-AMERICAN EXPOSITION

GENERAL EXHIBITS.

In order that a creditable exhibit of our live stock and poultry might be made at Buffalo, the Ontario Department of Agriculture joined with the Dominion Department in defraying the expenses of making exhibits. The aim was to have quality rather than quantity, and to attain this end inspectors were appointed to inspect all animals entered, to see that they were of sufficient merit before the entries were accepted. The expense of making the inspections, and also the freight charges from exhibitors' homes to central points of aggregation, were borne by the Ontario Department of Agriculture, while the Dominion Department paid the balance of the freight charges to and from Buffalo and also supplied feed for the stock while at the Exposition. In the case of poultry and pet stock, instead of paying a portion of the transportation the Ontario Department of Agriculture paid twenty-five cents on each entry except in the case of pigeons, on which ten cents was paid for each entry.

The Dominion Department of Agriculture appointed Mr. E. B. Elderkin, Amherst, N.S., as superintendent of Canadian live stock at the Pan-American Exposition, and Mr. J. H. Saunders, London, Ont., as Poultry Superintendent during the time the poultry was at the Exposition. The Ontario poultry exhibit was made up of two main shipments. One from Toronto was under the care of Mr. C. J. Daniels of Toronto, and the other went from London in charge of Mr. Wm. McNeil, of London.

The following inspectors for the Ontario live stock and poultry were appointed by the Ontario Department of Agriculture :

Robert Beith, Bowmanville ; Dr. J. H. Reed, Guelph ; W. W. Ballantyne, Stratford ; Prof. G. E. Day, Guelph ; A. W. Smith, Maple Lodge ; G. W. Clemons, St. George ; John Jackson, Abingdon ; Prof. H. H. Dean, Guelph ; H. Smith, Hay ; Wm. McNeil, London.

The inspection was done under the direction of the Secretary of the Live Stock Association, to whom applications for entry were made. The Secretary also made the entries for Ontario exhibitors, and had charge of all freight and shipping arrangements to Buffalo.

The following comparative statement will show how highly successful Ontario stock was in competition with the best products of the American breeders. In making this table we have considered only those classes in which Ontario exhibitors competed, nor have we considered the winnings of live stock from the other Canadian provinces :

Class.	Number of entries.		Prize money won.		Sweepstake meda's won.		Total number of prizes won.		Per cent. of prizes on entries.	
	Ont.	U. S.	Ont.	U. S.	Ont.	U. S.	Ont.	U. S.	Ont.	U. S.
			$ c.	$ c.						
Cattle	172	478	1,768 40	3,470 90	5	7	71	188	42	39
Horses	51	38	755 00	857 50	1	1	32	30	63	79
Sheep	393	269	1,915 00	1,365 62	5	8	197	75	50	28
Swine	118	114	447 50	165 00	4	2	74	41	63	36
Poultry and Pet Stock*	1,081	1,356	1,190 00	1,221 00	.....	.....	.....	.....	.....	.....
Totals	1,815	2,255	6,075 90	7,080 02	15	18	374	334	51	37

* In addition to the cash prizes in poultry and pet stock, Ontario won 43 prizes for breeding pens and the United States won 28 prizes.

The dates of exhibition of the different classes were as follows :—

Swine –August 26th to September 7th.

Cattle—September 9th to September 21st.

Sheep—September 23rd to October 5th.

Horses—October 7th to October 19th.

Poultry and Pet Stock—October 21st to October 31st

The amounts of cash prizes won by Ontario and United States in the different classes and sections in which they competed are as follows :—

Swine.	Ontario.	United States.
Berkshires	$70 00	$140 00
Yorkshires	173 75	18 75
Tamworths	203 75	6 25
	$447 50	$165 00
Cattle		
Short Horn	$823 40	$418 40
Aberdeen Angus	72 50	480 00
Galloway	212 50	227 50
Guernsey	130 00	710 00
Ayrshire	22 50	130 00
Holstein	412 50	930 00
Devon	35 00	525 00
Fat Cattle	60 00	
	$1,768 40	$3,470 90
Sheep.		
Lincoln	$336 25	.....
Southdown	65 00	$211 87
Shropshire	382 50	148 75
Dorset Horn	345 00	206 25
Leicester	406 25	
Hampshire Down	250 00	246 25
Oxford Down	60 00	552 50
Yearling Rams	70 00	.....
	$1,915 00	$1,365 62
Horses.		
Standard Bred	$82 50	$322 50
Cleveland Bay	40 00	.....
Thoroughbred	37 50	...
English Shire	127 50	
Hackney	70 00	535 00
Clydesdale	357 50	.....
French Canadians	40 00	
	$755 00	$857 00

The following list gives the Ontario exhibitors in the different classes, the number of Ontario and United States entries in the different sections, and the prizes won by Ontario exhibitors :—

Exhibitors of Swine.

Brethour & Saunders, Burford.....Large Yorkshires.
Cox, T. A., Brantford .....Berkshires.
Flatt, D. C. & Son, Millgrove .....Large Yorkshires.
Nichol, John C., Hubrey .....Tamworths.
Reid, R. & Co., Hintonburg .....Tamworths.

Tamworths

Tamworth Boar, two years or over—U.S. entries, 1 ; Ont. entries, 4 ; 1st and 5th prizes, J. C. Nichol ; 2nd and 4th prizes, R. Reid & Co.

Tamworth Boar, one year and under two—U.S., 2 ; Ont., 3 ; 1st prize, R. Reid & Co ; 2nd prize, J. C. Nichol.

Tamworth Boar, six months and under one year—U.S., 3 ; Ont., 3 ; 1st prize, J. C. Nichol ; 2nd and 3rd prizes, R. Reid & Co,

Tamworth Boars, under six months—U.S., 2 ; Ont., 8 ; 1st, 2nd, 3rd and 4th prizes, J. C. Nichol ; 5th prize, R Reid & Co.

Tamworth Sow, two years or over—U.S., 2 ; Ont., 6 ; 1st, 2nd and 4th prizes, J. C. Nichol ; 3rd and 5th prizes, R. Reid & Co.
Tamworth Sow, one year and under two—U.S., 2 ; Ont., 5 ; 1st prize, J. C. Nichol ; 2nd and 3rd prizes, R. Reid & Co.
Tamworth Sow, six months and under one year—U.S., 2 ; Ont., 5 ; 1st, 4th and 5th prizes, J. C. Nichol ; 2nd prize, R. Reid & Co.
Tamworth Sow, under six months—U.S., 2 ; Ont., 8 ; 1st, 2nd and 4th prizes, J. C. Nichol ; 3rd prize, R. Reid & Co.
Tamworth Boar, any age, Sweepstakes—U.S., 0 ; Ont., 3 ; 1st prize, J. C. Nichol.
Tamworth Sow, any age, Sweepstake—U.S., 0 ; Ont., 5 ; 1st prize, J. C. Nichol.

Large Yorkshires.

Large Yorkshire Boar, two years and over—U.S., 1 ; Ont., 4 ; 1st prize, D. C. Flatt & Son ; 2nd and 3rd, Brethour & Saunders.
Large Yorkshire Boar, one year and under two—U.S., 2 ; Ont., 3 ; 1st prize, D. C. Flatt & Son.
Large Yorkshire Boar, six months, under one year—U.S., 2 ; Ont., 8 ; 1st, 4th and 5th prizes, Brethour & Saunders ; 2nd prize, D. C. Flatt & Son.
Large Yorkshire Boar, under six months—U.S., 2 ; Ont., 6 ; 1st, 2nd, 4th and 5th prizes, Brethour & Saunders ; 3rd prize, D. C. Flatt & Son.
Large Yorkshire Sow, two years or over—U.S., 3 ; Ont., 6 ; 1st, 4th and 5th prizes, Brethour & Saunders; 2nd prize, D. C. Flatt & Son.
Large Yorkshire Sow, one year and under two—U.S., 2 ; Ont., 6 ; 1st and 4th prizes, D. C. Flatt & Son; 2nd, 3rd and 5th prizes, Brethour & Saunders
Large Yorkshire Sow, six months and under one year—U.S., 2 ; Ont., 6 ; 1st and 3rd prizes, D. C. Flatt; 2nd, 4th and 5th prizes, Brethour & Saunders.
Large Yorkshire Sow, under six months—U.S., 5 ; Ont., 5 ; 1st and 5th prizes, D. C. Flatt & Son ; 2nd, 3rd and 4th prizes, Brethour & Saunders.
Large Yorkshire Boar, Sweepstake—U.S., 4 ; Ont., 2 ; 1st prize, D. C. Flatt & Son.
Large Yorkshire Sow, Sweepstake—U.S., 3 ; Ont., 1 ; 1st prize, Brethour & Saunders.

Berkshires

Berkshire Boar, two years or over—U.S., 4 ; Ont., 4 ; 2nd prize, T. A. Cox.
Berkshire Boar, one year and under two—U.S., 4 ; Ont., 1.
Berkshire Boar, six months and under one year—U.S., 6 ; Ont., 2 ; 2nd prize, T. A. Cox
Berkshire Boar, under six months—U.S., 14 ; Ont., 4 ; 1st and 2nd prizes, T. A. Cox.
Berkshire Sow, two years or over—U.S., 9 ; Ont., 4 ; 1st and 5th prizes, T. A. Cox.
Berkshire Sow, six months, under one year—U.S., 23 ; Ont., 4 ; 1st prize, T. A. Cox.
Berkshire Sow, under six months—U.S., 12 ; Ont., 4 ; 1st prize, T. A. Cox.

Exhibitors of Cattle.

Bowman, Jas., Guelph	Aberdeen Angus.
Clark, J. G., Ottawa	Ayrshire.
Clemons, G. W., St George	Holsteins.
Flatt, W. D. & Son, Hamilton	Shorthorn
Massey, W. E. H., Toronto	Guernsey.
McCrae, D., Guelph	Galloway.
McDonald Bros., Woodstock	Shorthorn.
Phillips, F. W., Oakville	Aberdeen Angus.
Rice, Geo., Currie's Crossing	Holstein.
Rudd, W. J., Eden Mills	Devon.
Watt, J. & W. B., Salem	Shorthorn.

Shorthorns

Shorthorn Herd—U. S. entries, 1 ; Ont. entries, 2 ; 1st prize, W. D. Flatt & Son.
Shorthorn Bull, three years or over—U. S., 2 ; Ont., 3 ; 1st and 3rd prizes, W. D. Flatt & Son ; 6th prize, McDonald Bros.
Shorthorn Bull, two years and under three—U. S., 0 ; Ont., 2 ; 1st prize, W. D. Flatt & Son ; 3rd prize, J. & W. B. Watt.
Shorthorn Bull, one year and under two—U. S., 4 ; Ont., 2 ; 1st prize, W. D. Flatt & Son.
Shorthorn Bull, under one year—U. S., 2 ; Ont., 8 ; 1st and 4th prizes, J. & W. B. Watt ; 3rd prize, W. D. Flatt & Son.
Shorthorn Cow, three years or over—U. S., 2 ; Ont., 3 ; 1st, 2nd and 4th prizes, W. D. Flatt & Son.
Shorthorn Heifer, two years and under three—U. S., 4 ; Ont., 2.
Shorthorn Heifer, one year and under two—U. S., 6 ; Ont., 4 ; 2nd prize, W. D. Flatt & Son
Shorthorn Heifer Calf—U. S., 9 ; Ont., 5 ; 2nd prize, McDonald Bros.; 3rd prize, W. D. Flatt & Son.
Shorthorn Bull, any age, Sweepstakes—U. S., 2 ; Ont., 2 ; 1st prize, W. D. Flatt & Son.
Shorthorn Cow, any age, Sweepstakes—U. S., 2 ; Ont., 4 ; 1st prize, W. D. Flatt & Son

Aberdeen Angus.

Aberdeen Angus Herd—U. S., 5 ; Ont., 1 ; 2nd prize, Jas. Bowman.
Aberdeen Angus Bull, three years and over—U. S., 2 ; Ont., 1 ; 2nd prize, Jas. Bowman.
Aberdeen Angus Bull, two years and under three—U. S., 5 ; Ont., 1 ; 3rd prize, F. W. Phillips.
Aberdeen Angus Bull, under one year—U. S., 5 ; Ont., 2.

Aberdeen Angus Cow, three years or over—U. S., 7 ; Ont., 3 ; 4th and 5th prizes, Jas. Bowman.
Aberdeen Angus Heifer, two years and under three—U. S., 8 ; Ont., 1 ; 3rd prize, Jas. Bowman.
Aberdeen Angus Heifer, one year and under two—U. S., 11 ; Ont., 1.
Aberdeen Angus Heifer Calf—U. S., 9 ; Ont., 1 ; 5th prize, Jas. Bowman.
Aberdeen Angus Bull, any age, Sweepstakes—U. S., 7 ; Ont., 3.
Aberdeen Angus Cow, any age, Sweepstakes—U. S., 11 ; Ont , 1.

Galloways.

Galloway Herd—U. S., 2 ; Ont., 1 ; 2nd prize, D. M. McCrae.
Galloway Bull, three years and over—U. S., 1 ; Ont , 2 ; 1st prize, D. McCrae.
Galloway Bull, two years old and under three—U. S., 0 ; Ont., 1 ; 1st prize, D. McCrae.
Galloway Bull, one year and under two—U. S., 1 ; Ont., 1 ; 2nd prize, D. McCrae.
Galloway Bull, under one year—U. S., 3 ; Ont , 2 ; 3rd prize, D. McCrae
Galloway Cow, three years or over—U. S., 2 ; Ont., 3 ; 2nd and 3rd prizes, D. McCrae.
Galloway Heifer, two years old and under three—U. S., 3 ; Ont., 2 ; 3rd prize, D. McCrae.
Galloway Heifer, 1 year and under two—U. S., 2 ; Ont., 2 ; 2nd and 3rd prizes, D. McCrae.
Galloway Heifer Calf—U. S., 3 ; Ont., 2 ; 1st and 4th prizes, D. McCrae.
Galloway Bull, any age, Sweepstakes—U. S , 2 ; Ont., 1 ; 1st prize, D. McCrae.
Galloway Cow, any age, Sweepstakes—U. S , 1 ; Ont., 1.

Devons.

Devon Herd—U. S., 5 ; Ont., 1.
Devon Bull three years or over—U. S., 7 ; Ont., 1.
Devon Bull, two years and under three—U. S., 3 ; Ont., 2 ; 3rd and 4th prize, W. J. Rudd
Devon Bull, one year and under two—U. S., 4 ; Ont., 1.
Devon Bull, under one year—U. S., 7 ; Ont , 1 ; 3rd prize, W. J. Rudd.
Devon Cow, three years or over—U S., 16 ; Ont., 3.
Devon Heifer, two years old and under three—U.S., 8 : Ont., 1 ; 2nd prize, W. J. Rudd.
Devon Heifer Calf—U.S , 10 ; Ont., 2 ; 2nd and 4th prizes, W. J. Rudd.
Devon Bull, any age, Sweepstakes—U.S., 3 : Ont., 1.
Devon Cow, any age, Sweepstakes—U.S., 3 ; Ont., 1.

Holsteins.

Holstein Herd—U.S,, 6 ; Ont., 2 ; 2nd prize, Geo. Rice.
Holstein Bull, three years or over—U.S., 9 ; Ont , 2 ; 3rd prize, G. W. Clemons.
Holstein Bull, two years and under three—U S., 6 ; Ont., 3 ; 2nd prize. G. W. Clemons ; 5th prize, Geo. Rice.
Holstein Bull, one year and under two—U.S., 8 ; Ont., 2.
Holstein Bull, under one year—U.S., 10 ; Ont 6 ; 4th prize, Geo. Rice.
Holstein Cow, three years or over—U.S., 32 , Ont., 7 ; 1st prize, Geo. Rice.
Holstein Heifer, two years and under three—U.S., 14 ; Ont., 3 ; 2nd prize, Geo. Rice.
Holstein Heifer, one year and under two—U.S., 14 ; Ont., 8 ; 1st prize, G. W. Clemons; 3rd and 4th prizes Geo. Rice.
Holstein Heifer Calf—U.S., 14 ; Ont., 6 ; 1st prize, G. W. Clemons.
Holstein Bull, any age, Sweepstakes—U.S., 10 ; Ont., 3.
Holstein Cow, any age, Sweepstakes—U.S., 7 ; Ont . 3 ; 1st prize, Geo. Rice.
Special Prizes offered by the Holstein-Freisian Association—U.S., 3 ; Ont., 4 ; 1st prize, G. W. Clemons 5th prize, Geo. Rice.
Prize No. 2—U S., 4 ; Ont., 3 ; 2nd prize, G. W. Clemons.
Prize No. 3—U.S., 7 ; Ont., 3 ; 3rd prize, G. W. Clemons.

Ayrshires.

Ayrshire Herd—U.S., 6 ; Ont., 1 ; 5th prize, J. G. Clark.
Ayrshire Bull, three years or over—U.S., 6 ; Ont., 1.
Ayrshire Bull, two years and under three—U.S., 5 ; Ont., 1 ; 4th prize, J. G. Clark.
Ayrshire Bull, under one year—U.S., 4 ; Ont., 1.
Ayrshire Cow, three years or over—U.S., 16 ; Ont., 3.
Ayrshire Heifer, two years and under three—U.S., 6 ; Ont., 2 ; 2nd prize, J. G. Clark.
Ayrshire Heifer, one year and under two—U S., 11 ; Ont., 3.
Ayrshire Heifer Calf—U.S., 8 ; Ont., 2.
Ayrshire Bull, any age, Sweepstakes—U.S , 4 ; Ont., 1.
Ayrshire Cow, any age, Sweepstakes—U.S., 4 ; Ont., 1.

Guernseys.

Guernsey Bull, one year and under two—U.S., 6 ; Ont., 1 ; 1st prize, W. E. H. Massey.
Guernsey Bull, under one year—U.S., 9 ; Ont., 1.
Guernsey Cow, three years or over—U.S., 13 ; Ont., 4 ; 1st, 3rd and 5th prizes, W. E. H. Massey.
Guernsey heifer, two years and under three—U.S., 11 ; Ont., 1.
Guernsey heifer, one year and under two—U.S., 12 ; Ont., 4.
Guernsey Heifer Calf—U.S , 14 : Ont., 1.
Guernsey Bull, any age, Sweepstakes—U.S , 3 ; Ont., 1.
Guernsey Cow, any age, Sweepstakes—U.S., 6 ; Ont., 1 ; 1st, W. E. H. Massey.
Sweepstakes, Special—Cow—1st prize, W. E H. Massey.

Fat Cattle.

Single Fat Cow—U S., 0 ; Ont.; 3 ; 1st and 2nd, James Bowman.

EXHIBITORS OF SHEEP.

Campbell, John, Woodville.....Shropshire.
Empey, M. Neville, Napanee.....Dorset Horn.
Gardhouse, J. M., Highfield.....Leicesters.
Gibson, John T., Denfield.....Lincoln
Hanmer, D. G. & J. G., Mount Vernon.....Shropshires
Harding, R. H., Thorndale.....Dorset Horn.
Jackson, John & Son, Abingdon.....Southdown.
Jull, J. H. & Sons, Mount Vernon.....Oxford Down.
Kelly, John, Shakespeare.....Hampshire and Leicester.
McEwen, Robert, Byron.....Southdown.
McGillivray, J. A., Uxbridge.....Dorset Horn.
Patrick, Eugene, Ilderton.....Lincoln
Patrick, J. H., Ilderton.....Lincoln,
Phin, George, Hespeler.....Shropshire.
Smith, W. A., Maple Lodge.....Leicester.
Whitelaw, A. & W., Guelph.....Leicester.

LINCOLNS.

Lincoln Ram, two years and over—U. S. entries, 1 ; Ont. entries, 12 ; 1st and 3rd prizes, J. T. Gibson ; 2nd prize, J. H. Patrick ; 4th prize, Eugene Patrick
Lincoln Ram, one year and under two—U.S., 0 ; Ont., 11 ; 1st, 2nd and 4th prizes, J. H. Patrick ; 3rd prize, J. T. Gibson.
Lincoln Ram, under one year—U.S., 0 ; Ont., 12 ; 1st and 2nd prizes, J. H. Patrick ; 3rd, 4th and 5th prizes, J. T Gibson.
Lincoln Ewe, two years and over—U.S., 0 ; Ont., 12 ; 1st, 2nd, 3rd, 4th and 5th prizes, J. T. Gibson.
Lincoln Ewe, one year and under two—U.S., 0 ; Ont., 12 ; 1st, 2nd and 5th prizes, J. T. Gibson ; 3rd and 4th prizes, J. H. Patrick.
Lincoln Ewe, under one year—U.S., 0 ; Ont., 12 ; 1st, 2nd, 3rd and 5th prizes, J. H. Patrick ; 4th prize, J. T. Gibson.
Lincoln Sweepstake—Ram, any age—U.S., 0 ; Ont., 2 ; J. H Patrick. Ewe, any age—U.S., 0 ; Ont., 2; J. T. Gibson.
Lincoln specials—Flock—1st prize, J. T. Gibson ; 2nd prize, J. H. Patrick.
Sweepstakes—Ram, any age, J. H. Patrick. Ewe, any age, J. T. Gibson.

SHROPSHIRES.

Shropshire Ram, two years or over, U S., 10 ; Ont , 8 ; 1st prize, D. G. & J. G. Hanmer ; 2nd prize, John Campbell ; 5th prize, R. Gibson.
Shropshire Ram, one year and under two—U.S., 17 ; Ont., 16 ; 3rd, 4th and 5th prizes, Jno. Campbell.
Shropshire Ram, under one year—U.S., 14 ; Ont., 12 ; 1st, 3rd and 5th prizes, D. G. & J G. Hanmer : 2nd prize, Jno. Campbell.
Shropshire Ewe, two years and over—U.S , 11 ; Ont., 5 ; 2nd, 3rd and 5th prizes, Jno. Campbell ; 4th prize, D. G. & J. G. Hanmer.
Shropsbire Ewe, one year and under two—U S., 16 ; Ont , 8 ; 4th prize, D. G & J. G. Hanmer.
Shropshire Ewe, under one year—U. S., 14 ; Ont., 12 ; 1st and 2nd prizes, D. G. & J. G. Hanmer ; 4th prize, John Campbell ; 5th prize, Geo Phin.
Sweepstakes—Ram—U.S., 6 ; Ont , 3.
Shropshire Ewe—U.S , 4 ; Ont., 2.
Shropshire Flock—2nd prize, D. G. & J. G. Hanmer ; 3rd prize, John Campbell.

Special Prizes awarded by the Shropshire Register Association.

Ram, two years old and over—1st prize, John Campbell ; 2nd prize, R Gibson.
Ram, one year old and under two—1st, 2nd and 3rd prizes, John Campbell.
Lamb—1st prize, John Campbell ; 2nd and 3rd prizes, D. G. and J. G. Hanmer.
Ewe, two years old and over—1st and 2nd prizes, John Campbell.
Ewe, one year old and under two—1st prize, D. G. & J. G. Hanmer ; 2nd and 3rd prizes, John Campbell.
Lamb—1st prize, John Campbell ; 2nd prize, Geo. B. Phin ; 3rd and 4th prizes. D. G. & J. G. Hanmer.
Aged Flock—1st prize, John Campbell ; 2nd prize, D. G. & J. G. Hanmer.
Young Flock—1st prize, D G. & J. G. Hanmer ; 2nd prize, John Campbell ; 3rd prize. Geo. B. Phin.
Best five yearling rams—1st prize, John Campbell ; 2nd prize, Richard Gibson ; 3rd prize, Geo. B. Phin.
Sweepstakes—Best Ram, any age—1st prize, John Campbell.

HAMPSHIRES.

Hampshire Down Ram, two years and over—U.S., 2 ; Ont., 1 ; 3rd prize, Jno Kelly.
Hampshire Down Ram, one year and under two—U.S., 2 ; Ont., 2 : 3rd prize. Jno. Kelly.
Hampshire Down Ewe, two years and over—U.S., 2 ; Ont., 4 ; 1st prize, John Kelly.
Hampshire Down Ewe, one year and under two—U S., 2 ; Ont., 1 ; 3rd prize, J. Kelly.
Hampshire Down Ewe, under one year—U.S , 2 ; Ont , 2 ; 2nd and 3rd prizes, John Kelly.
Sweepstakes—Ram—U. S., 2 ; Ont., 2. Ewe—U.S., 1 ; Ont., 1.
Flocks—U.S., 3 ; Ont., 1 ; 2nd prize, John Kelly.

Special Prizes awarded by the Hampshire Down Breeders' Association of America

Hampshire Down Ram, two years old or over—1st and 2nd prizes, John Kelly.
Hampshire Down Ram, one year old and under two—1st and 2nd prizes, John Kelly.
Hampshire Down Ewe, two years old or over—1st and 2nd prizes, John Kelly.
Hampshire Down Ewe, one year old and under two—1st and 2nd prizes, John Kelly.
Hampshire Down Ewe Lamb, under one year—1st and 2nd prizes, John Kelly.
Best Hampshire Down Ram, any age—1st prize, John Kelly.
Best Hampshire Down Ewe, any age—1st prize, John Kelly.

DORSET HORNS.

Dorset Horn Ram, two years or over—U.S., 2; Ont., 4; 2nd and 5th prizes, John McGillivray; 4th prize, M. N. Empey.
Dorset Horn Ram; one year and under two—U.S., 3; Ont., 5; 3rd prize, J. A. McGillivray; 4th prize, M. N. Empey; 5th prize, R. H. Harding.
Dorset Horn Ram, under one year—U.S., 3; Ont., 9; 3rd prize, M. N. Empey; 4th and 5th prizes, J. A. McGillivray.
Dorset Horn Ewe, two years or over—U.S., 2; Ont., 11; 1st and 4th prizes, J. A. McGillivray; 2nd and 3rd prizes, R. H. Harding.
Dorset Horn Ewe, one year and under two—U.S., 2; Ont., 12; 2nd and 3rd prizes, J. A. McGillivray; 4th prize, R. H. Harding.
Dorset Horn Ewe, under one year—U.S., 3; Ont., 12; 4th prize, J. A. McGillivray; 5th prize, M. N. Empey.
Dorset Horn Sweepstakes—Ram U.S., 1; Ont., 5.
Ewe—U.S., 2; Ont., 5; J. A. McGillivray
U.S., 2; Ont., 4; 2nd prize, J. A. McGillivray; 3rd prize, R. H. Harding; 4th prize, M. N. Empey.

Special Prizes awarded by the Dorset Horn Sheep Association of America.

Best Dorset Horn Yearling Ram—1st prize, John A. McGillivray, ; 2nd prize, M. N. Empey.
Best Dorset Horn Ram Lamb—1st prize, M. N. Empey; 2nd prize, J. A. McGillivray.
Best Dorset Horn Yearling Ewe—1st prize, J. A. McGillivray; 2nd prize, M. N. Empey.
Best Dorset Horn Ewe Lamb—1st prize, M. N. Empey; 2nd prize, J. A. McGillivray.
Best Dorset Horn Ewe and Ram Lamb—1st prize, M. N. Empey; 2nd prize, J. A. McGillivray.
Best Dorset Horn Ewe and one Lamb—1st prize, M. N. Empey; 2nd prize, J. A. McGillivray.
Best Dorset Horn Ewe and Lambs, sucklings—1st prize, M. N. Empey; 2nd prize, J. A. McGillivray.
Best six Dorset Horn Lambs not in above classes—1st prize, J. A. McGillivray.
Best twelve Dorset Horn Lambs, not in above classes—1st prize, J. A. McGillivray.
Best six Suckling Dorset Horn Lambs, not in above classes—1st prize, J. A. McGillivray.
Best pen of Dorset Horns consisting of—
One yearling ram, one ram lamb; one yearling ewe, one ewe lamb, and the best ewe and suckling lamb or lambs; 1st prize, M. N. Empey.

Special Prizes awarded by the Continental Dorset Club.

Best and largest exhibit of Dorsets—1st prize, J. A. McGillivray.
Best and largest exhibit of Dorset Ewes with lamb or lambs by side—1st prize, J. A. McGillivray.
Best Ram, any age—2nd prize, J. A. McGillivray.
Best pen of Rams to consist of two Rams and two Ewes—1st prize, J. A. McGillivray; 2nd prize, R. H. Harding.

LEICESTERS.

Best Leicester Ram two years and over.—U.S., 1; Ont., 10; 1st and 4th prizes, A. W. Smith; 2nd prize, A. & W. Whitelaw; 3rd prize, J. M. Gardhouse.
Best Leicester Ram, one year and under two.—U.S., 1; Ont., 15; 1st prize, A. & W. Whitelaw; 2nd prize, J. M. Gardhouse; 3rd and 5th prizes, A. W. Smith; 4th prize, John Kelly.
Best Leicester Ram, under 1 year.—U.S., 1; Ont., 11; 1st prize, John Kelly; 2nd prize, J. M Gardhouse; 3rd prize, A. & W. Whitelaw.
Best Leicester Ewe, two years and over.—U.S., 1; Ont., 14; 1st, 4th and 5th prizes, A. W. Smith; 2nd and 3rd prizes, J. M. Gardhouse.
Best Leicester Ewe, one year and under two.—U.S., 0; Ont., 13; 1st and 4th prizes, A. & W. Whitelaw; 2nd prize, J. M. Gardhouse; 3rd and 5th prizes, A. W. Smith.
Best Leicester Ewe under one year.—U.S., 0; Ont., 13; 1st, 3rd and 4th prizes, John Kelly; 2nd prize, J. M. Gardhouse; 5th prize, A. & W. Whitelaw.
Leicester, Sweepstakes—Ram, any age.—U.S., 0; Ont., 4; 1st prize, A. & W. Whitelaw.
Ewe, any age—U.S., 0; Ont 4; 1st prize, A. & W. Whitelaw.
Flocks.—U.S., 1; Ont., 5: 1st prize, A. W. Smith; 2nd prize, J. M. Gardhouse; 3rd prize, A. & W. Whitelaw.

Special Prizes awarded by the American Leicester Breeders' Association.

Best Ram and three Ewes, two years and over.—1st prize, A. W. Smith; 2nd prize, J. M. Gardhouse.
Pen of Shearlings.—1st prize, A. & W. Whitelaw; 2nd prize, J. M Gardhouse.
Pen of Lambs.—1st prize, John Kelly; 2nd prize, A. & W. Whitelaw.

Oxford Downs.

Oxford Down Ram, two years and over.—U.S., 9; Ont., 1; 3rd prize, J. H. Jull & Son.
Oxford Down Ram, one year and under two.—U.S., 9; Ont., 2.
Oxford Down Ram, under one year.—U.S., 8; Ont., 2.
Oxford Down Ewe, two years and over.—U.S., 9; Ont., 2; 2od and 5th prizes, J. H. Jull & Son.
Oxford Down Ewe, one year and under two.—U.S., 7; Ont, 2; 4th and 5th prizes, J. H. Jull.
Oxford Down Ewe, under one year.—U.S., 8; Ont. 2.
Oxford Down Sweepstakes.—Ram.—U.S., 7; Ont., 1.
Ewe.—U.S., 2; Ont., 2.
Flocks.—U.S., 6; Ont., 1; 3rd prize, J. H. Jull & Son.

Southdowns.

Southdown Ram, two years old and over.—U.S., 8; Ont., 3; 3rd and 4th prizes, John Jackson & Son.
Southdown Ram, one year old and under two.—U.S., 5; Ont., 7; 2od and 4th prizes, John Jackson & Son; 3rd prize, Robert McEwen
Southdown Ram, under one year.—U.S., 6; Ont., 10; 5th prize, John Jackson & Sons.
Southdown Ewe, two years and over.—U.S., 6; Ont., 10; 2nd, 3rd and 4th prizes, John Jackson & Sons; 5th prize, Robert McEwen.
Southdown Ewe, one year and under two.—U.S., 7; Ont., 9; 2nd and 4th prizes, John Jackson & Sons.
Southdown Ewe, under one year.—U.S., 6; Ont., 10.
Sweepstakes.—Ram.—U.S., 4; Ont., 2.
Ewe.—U.S., 4; Ont., 1
Flocks.—U.S., 3; Ont., 1; 3rd prize, John Jackson.
Pen of five Yearling Rams, any breed.—U.S., 20; Ont., 16; 1st prize, John Campbell; 2nd prize, A. W. Smith; 3rd prize, John Jackson.

Exhibitors of Horses.

Bawden & McDonell, Exeter	Clydesdale and English Shire.
Beith, Robert, Bowmanville	Hackney.
Devitt, I. & Son, Freeman	Clydesdale.
Fleming W., Exeter	Thoroughbred
Frank, A. & Son, The Grange	"
Gormley, A. G., Unionville	Clydesdale.
Graham Bros., Claremont	"
Heslop, F. A., Appleby	Standard Bred.
Hewson, Albert, Grahamsville	Cleveland Bay.
Hodgkinson & Teasdale, Beaverton	Clydesdale.
Kennedy, Geo. W., Ilderton	Standard Bred.
McHugh, Geo., Lindsay	"
Mooney, Samuel C., Vankleek Hill	French Canadian.
Skinner, Thos., Mitchell	Clydesdale.
Stong Milton, Willowdale	Standard Bred.
Whillihan & Slack, St Marys	Clydesdale.

Cleveland Bays.

Cleveland Bay Stallion, three years and over—U.S. entries, 0; Ont. entries, 1; 1st prize, Albert Hewson.

Thoroughbreds.

Thoroughbred Stallion, three years and over—U.S., 0; Ont., 2; 2nd prize, W. W. Fleming; 3rd prize, A. Frank & Son.

English Shires.

English Shire Stallion, three years old and over—U.S., 3; Ont., 5; 1st, 2nd and 3rd prizes, Bawden & McDonell.

English Shire Brood mare, to be shown with foal at foot by registered sire—U.S., 2; Ont., 1; 1st prize, Bawden & McDonell.

Clydesdales

Clydesdale Stallion, three years and over—U.S., 0; Ont., 5; 1st prize, Graham Bros.; 2nd and 5th prizes, H. G. Boag.

Clydesdale Stallion, two years and under three—U.S., 0.; Ont., 2; 1st prize, Graham Bros.; 2nd prize, Thos. Skinner

Clydesdale Stallion, one year and under two—U.S., 0; Ont., 4; 1st prize, Graham Bros; 2nd and 4th prizes, Slack & Whillian.

Clydesdale Mare, three years or over—U.S., 0; Ont., 6; 1st prize, Graham Bros.; 2nd prize, Hodgkinson & Tisdale; 3rd and 4th prizes, A. G. Gormley.

Clydesdale Filly, two years and under three—U.S., 0; Ont., 4; 1st prize, Hodgkinson & Tisdale.

Clydesdale Filly, one year and under two—U.S., 0; Ont., 3; 1st prize, Hodgkinson & Tisdale.
Clydesdale Brood Mare, to be shown with foal at foot with registered sire—U.S., 0; Ont., 3; 1st prize, Hodgkinson & Tisdale.
Sweepstake Draft Mare, any breed—U.S., 3; Ont., 1; Hodgkinson & Tisdale.

Hackneys.

Hackney Stallion, three years and over—U.S., 4; Ont., 3; 2nd and 4th prizes, Robt. Beith.
Hackney Stallion, two years and under three—U.S., 5; Ont., 1;
Hackney Stallion, one year and under two—U.S., 3; Ont., 1;
Mare, three years and over—U.S., 4; Ont., 1; 3rd prize, Robt. Beith.
Filly, two years and under three—U.S., 2; Ont., 1; 2nd prize, Robt Beith.
Filly, one year and under two—U.S., 2; Ont., 1;
Standard Bred Stallion, three years and over—U.S., 3; Ont., 3; 2nd prize, F. A. Hyslop; 5th prize, Milton Strong
Stallion, one year and under two—U.S., 3; Ont., 1; 1st prize, Geo. W. Kennedy.
Filly, two years and under three—U.S., 2; Ont., 1; 3rd prize, Milton Strong.
Brood Mare, to be shown with foal at foot and one other of her produce, three years and under, all to be Standard Bred—U.S., 1; Ont., 1; 2nd prize, Milton Strong.
French Canadian Stallion, three years or over—U.S., 0; Ont., 1; 1st prize, Samuel C. Mooney.

Exhibitors of Poultry and Pet Stock.

Arthur, James, London, Ont.
Barber, W., & Co., Toronto, Ont.
Barker, R. K., Toronto, Ont.
Beattie, W. H., Wilton Grove, Ont.
Bogue, A., London, Ont.
Burn, M. T., Tillsonburg, Ont.
Brown, A. G., Watford, Ont.
Bell, W. J., Angus, Ont.
Berner, G., Toronto, Ont.
Bogue, Geo., Strathroy, Ont.
Butterfield, Mrs. S., London, Ont.
Carroll, James A., London, Ont.
Crowe, Charles R., Guelph, Ont.
Crowe, John, Guelph, Ont.
Cosh, Newton, & Co., London, Ont.
Colwell, Geo., Paris Station, Ont.
Daniels, C. J., Toronto, Ont.
Donovan, H. B., Toronto, Ont.
Dunne, Henry, Toronto, Ont.
Dewey, E. J., Toronto, Ont.
Dundas, Jas., Deer Park, Ont.
Emrick, Hy., Bridgeburg, Ont.
Furminger, S. D., St. Catharines, Ont.
Fox, Wm., Toronto, Ont.
Henderson, G. G., Hamilton, Ont.
Hammill, Wm., Toronto, Ont.
Holton, W. A., Hamilton, Ont.
Holmhurst Poultry Yards, Whitby, Ont.
Ionson, G. A., Ingersoll, Ont.
Jeffrey, J. S., St Catharines, Ont.
Kingsmill, T. F., London, Ont.
Ludwig, S. V., London, Ont.
Latta Bros., London, Ont.
McCurdy Bros., London, Ont.
McIntosh, Toronto, Ont
McIntyre, L., Norwich, Ont.
Middlemiss, Robt. C., Brantford, Ont.
McNeil, Wm., London, Ont.
Millard, I. K., Dundas, Ont.
Minshall, J. H., Brantford, Ont.
Masson, Joseph, Woodstock, Ont.
McKee, John, Norwich, Ont.
Morley, James, Milton, Ont.
Oke, Richard, London, Ont.
O'Neill, J. N., Toronto, Ont.
Oke & Andrews, London, Ont.
Osborne, W. M., Brockville, Ont.
Pfaff, Adam, Guelph, Ont.
Patton, A., London, Ont.
Rogers, R., Hamilton, Ont.
Sage, Lewis C., London, Ont.
Spry & Mick, Toronto.
Stagg, N., St. Catharines.
Stewart, Chas A., London.
Saunders, J. W., London.
Sharp & Scott, London
Taylor, J. G., Woodstock, Ont.
Teale, W. J., Guelph, Ont.
Tossy, Geo. A., Hamilton
Vance, Geo., Woodstock, Ont.
Wyatt, Hugh, London, Ont.
Wall, Andrew, Hamilton, Ont.
Warrington, J. H., Cornwall, Ont.
Wolfe, W. J., Toronto, Ont.
Williams, Geo., Toronto, Ont.

Pan-American Poultry.

Silver Wyandottes.

Cock—U. S., 5; Ont., 2; 3rd and 6th prize, Jas. Arthur.
Hen—U. S., 5; Ont., 1; 4th prize, Jas. Arthur.
Cockerel—U. S., 7; Ont., 4; 1st, 6th and 7th prizes, Jas Arthur.
Pullet—U. S., 11; Ont., 4; 5th and 7th prizes, Jas. Arthur; 6th prize, Geo. Bogue.

Golden Wyandottes.

Cock—U. S., 5; Ont., 2; 3rd prize, C. J. Daniels; 5th prize, J. H. Saunders.
Hen—U. S. 4; Ont., 2; 3rd prize, C. J. Daniels.
Cockerel—U. S., 2; Ont., 2; 1st prize, C. J. Daniels.

White Wyandottes.

Cock—U. S. 26; Ont., 4; 3rd prize, T. F. Kingsmill.
Cockerel—U. S., 26; Ont., 5; 8th prize, J. S. Jeffrey.

Buff Wyandottes.

Cock—U. S., 8 ; Ont., 1 ; 3rd prize, Newton Cosh & Co.
Cockerel—U. S., 9 ; Ont., 2 ; 1st and 7th prizes, Newton Cosh & Co.
Pullet—U. S., 11 ; Ont., 2 ; 3rd and 4th prizes, Newton Cosh & Co.

Black Wyandottes.

Cock—U. S., 2 ; Ont., 2 ; 1st prize, Geo. Bogue ; 3rd prize, R. Oke.
Hen—U. S., 3 ; Ont., 1 ; 2nd prize, Geo. Bogue.
Pullet—U. S., 1 ; Ont. 2 ; 1st prize, R. Oke ; 2nd prize, Geo. Bogue.

Black Java.

Cock—U. S., 2 ; Ont., 4 ; 2nd prize, R. Oke ; 4th prize, Geo. Bogue.
Hen—U. S., 2 ; Ont., 4 ; 2nd and 3rd prize, C. J. Daniels ; 5th prize, R. Oke ; 6th prize, G. Bogue.
Cockerel—U. S., 2 ; Ont., 2 ; 3rd prize, C. J. Daniels ; 4th prize, R. Oke.
Pullet—U. S., 2 ; Ont., 2 ; 3rd prize, C. J. Daniels ; 4th prize. R. Oke.

Plymouth Rock.

U. S., 319 ; Ont., 39.

Barred Plymouth Rocks.

Cock—U. S., 19 ; Ont., 2 ; 3rd prize, Newton Cosh & Co.

Mottled Java.

Cock—U. S., 0 ; Ont., 2 ; 1st and 2nd prizes, R. Oke.
Hen—U. S., 0 ; Ont., 2 ; 1st and 2nd prizes, R. Oke.
Cockerel—U. S., 0 ; Ont., 2 ; 1st and 2nd prizes, R. Oke.
Pullet—U. S., 0 ; Ont., 1 ; 1st prize, R. Oke.

American Dominiques.

Cock—U. S., 2 ; Ont., 1 ; 1st prize, Geo. Bogue.
Cockerel—U. S., 3 ; Ont., 1 ; 1st prize, Geo. Bogue.
Pullet—U. S., 2 ; Ont., 1 ; 2nd prize, M. T. Burn.

Light Brahmas.

Hen—U. S., 12 ; Ont., 3 ; 4th prize, Thorpe & Scott.
Cockerel—U. S., 14 ; Ont., 3 ; 8th prize, Thorpe & Scott.
Pullet—U. S., 14 ; Ont., 4 ; 5th prize, Geo. A. Tosey.

Dark Brahmas.

Cock—U. S., 4 ; Ont., 2 ; 1st prize, L. C. Sage ; 3rd prize, Thorpe & Scott.
Hen—U. S., 3 ; Ont., 2 ; 2nd prize, Thorpe & Scott ; 3rd prize, L. C. Sage.
Cockerel—U. S., 3 ; Ont., 3 ; 1st and 2nd prize, L. C. Sage ; 3rd, Thorpe & Scott.
Pullet—U. S., 4 ; Ont. 2 ; 1st prize, L. C. Sage ; 2nd prize, Thorpe & Scott.

Buff Cochins.

Cock—U. S., 5 ; Ont., 5 ; 2nd and 5th prizes, Chas. A. Stewart.
Hen—U. S., 5 ; Ont., 6 ; 1st and 5th prize, Chas. A. Stewart ; 2nd, H. Wyatt ; 7th, H. Emerick.
Cockerel—U. S., 6 ; Ont., 4 ; 2nd and 4th prizes, Chas. A. Stewart ; 6th prize, H. Emerick.
Pullet—U. S., 4 ; Ont., 6 ; 1st prize, Chas. A. Stewart.

Partridge Cochin.

Hen—U. S., 1 ; Ont., 4 ; 1st and 2nd prize, Mrs. Butterfield ; 4th prize, R. Oke.
Cockerel—U.S., 0 ; Ont., 2 ; 1st and 2nd prizes, Mrs. Butterfield.
Pullet—U. S., 1 ; Ont., 3 ; 1st and 2nd prizes, Mrs. Butterfield ; 3rd, R. Oke.

White Cochin.

Cock—U.S., 0 ; Ont., 2 ; 1st prize, Latta Bros.
Hen—U.S., 1 ; Ont., 4 ; 1st prize, H. Emerick.
Cockerel—U.S., 0 ; Ont., 3 ; 1st and 2nd prizes, Latta Bros.
Pullet—U.S., 0 ; Ont., 2 ; 1st and 3rd prizes, Latta Bros.

Black Cochins.

Cock—U.S., 1 ; Ont., 3 ; 1st and 4th prizes, Latta Bros.; 3rd prize, H. Emerick.
Hen—U.S., 2 ; Ont., 3 ; 3rd and 4th prizes, Latta Bros.; 5th prize, H. Emerick.
Cockerel—U.S., 0 ; Ont., 3 ; 1st and 2nd prizes, Latta Bros.; 3rd prize. H. Emerick.
Pullet—U.S., 0 ; Ont., 3 ; 1st and 3rd prizes, Latta Bros.; 2nd prize, H. Emerick.

Black Langshans.

Cock—U.S., 4 ; Ont., 2 ; 4th prize, R. McCurdy.
Hen—U.S., 5 ; Ont., 3 ; 3rd prize, R. McCurdy ; 1st prize, E. J. Dewey.
Cockerel—U.S., 3 ; Ont., 3 ; 2nd and 3rd prizes R. McCurdy ; 4th prize, E. J. Dewey.
Pullet—U.S., 3 ; Ont., 2 ; 1st and 3rd prizes, R. McCurdy.

White Langshans.

Cock—U.S., 0 ; Ont., 1 ; 1st prize, M. T. Burn.
Hen—U.S., 0 ; Ont., 1 ; 1st prize, M. T. Burn.
Cockerel—U.S., 1 ; Ont., 1 ; 1st prize, Adam Pfaff.
Pullet—U.S., 1 ; Ont., 2 ; 2nd prize, Adam Pfaff ; 3rd prize, M. T. Burn.

S. C. Brown Leghorns.

Hen—U.S., 17 ; Ont., 3 ; 7th prize, G. G. Henderson.

S. C. White Leghorns.

Cock—U.S., 13 ; Ont., 2 ; 1st prize, John Ramsey.
Hen—U.S., 17 ; Ont., 3 ; 2nd prize, John Ramsey.
Cockerel—U.S., 18 ; Ont., 1 ; 8th prize, John Ramsey.

R. C. White Leghorns.

Cock—U.S., 2 ; Ont., 6 ; 3rd prize, R. Oke ; 7th prize, W. J. Bell ; 4th prize, J. H. McIntosh.
Hen—U.S., 2 ; Ont., 6 ; 1st prize, J. H. Masson ; 2nd prize, J. H. McIntosh ; 3rd prize, W. J. Bell ; 4th prize, R. Oke.
Cockerel—U.S., 2 ; Ont., 6 ; 2nd prize, J. H. Masson ; 3rd, W. J. Bell.
Pullet—U.S., 2 ; Ont., 4 ; 2nd prize, R. Oke ; 3rd, J. H. Masson ; 4th, W. J. Bell ; 5th and 6th, J. H. McIntosh.

S. C. Black Leghorns.

Cock—U. S., 3 ; Ont., 3 ; 2nd prize, C. J. Daniels ; 4th prize, W. M. Osborne.
Hen—U.S., 2 ; Ont., 3 ; 2nd prize, C. J. Daniels ; 3rd, W. M. Osborne.
Cockerel—U.S., 4 ; Ont., 3 ; 1st prize, C. J. Daniels ; 2nd and 4th, W. M. Osborne.
Pullet—U.S., 3 ; Ont., 3 ; 1st prize, C. J. Daniels ; 3rd, W. M. Osborne.

S. C. Buff Leghorns.

Cock—U.S., 8 ; Ont., 3 ; 1st prize, Spry & Mich ; 4th and 6th prizes, G. Whillians.
Cockerel—U.S., 13 ; Ont., 2 ; 6th prize, G. Berner.
Pullet—U.S., 13 ; Ont., 5 ; 2nd and 6th prizes, James Dundas ; 4th prize, G. Whillians ; 8th, G. Berne.

Mottled Anconas.

Cock—U.S., 2 ; Ont., 1 ; 3rd prize, C. J. Daniels.
Hen—U.S., 3 ; Ont., 1 ; 3rd prize, C. J. Daniels.
Cockerel—U.S., 1 ; Ont., 2 ; 2nd prize, C. J. Daniels ; 3rd prize, S. D. Furminger.
Pullet—U.S., 1 ; Ont., 2 ; 2nd prize, C. J. Daniels ; 3rd prize, S. D. Furminger.

Black Minorcas.

Cock—U.S., 5 ; Ont., 2 ; 1st and 2nd prizes, J. H. Minshall.
Hen—U.S., 5 ; Ont., 2 ; 3rd and 7th prizes, J. H. Minshall.

White Minorcas.

Cock—U.S., 5 ; Ont., 2 ; 1st prize, J. N. O'Neil.
Hen—U.S., 3 ; Ont., 2 ; 1st and 4th prizes, J. N. O'Neil.
Cockerel—U.S., 3 ; Ont., 4 ; 1st and 5th prizes, J. N. O'Neil.
Pullet—U.S., 3 ; Ont., 4 ; 3rd and 7th prizes, J. N. O'Neil ; 4th and 5th prizes, Hy. Dunne.

Blue Andalusians.

Cock—U.S., 1 ; Ont., 2 ; 1st and 2nd prizes, Newton Cosh & Co.
Hen—U.S., 1 ; Ont., 2 ; 1st and 2nd prizes, Newton Cosh & Co.
Cockerel—U.S., 0 ; Ont., 2 ; 1st and 2nd prizes, Newton Cosh & Co.
Pullet—U.S., 0 ; Ont., 2 ; 1st and 2nd prizes, Newton Cosh & Co.

Black Spanish.

Cock—U. S., 1 ; Ont., 4 ; 2nd prize, J. H. Warrington ; 3rd prize, M. T. Burn.
Hen—U. S., 2 ; Ont., 5 ; 1st prize, J. H. Warrington ; 5th prize; M. T. Burn.
Cockerel—U. S., 4 ; Ont., 3 ; 1st and 5th prizes, J. H. Warrington.
Pullet—U. S., 3 ; Ont., 3 ; 4th and 5th prizes, J. H. Warrington.

White Crested Black Polish.

Cock—U. S., 3 ; Ont., 3 ; 1st prize, R. C. Middlemiss ; 2nd prize, Wm. McNeil.
Hen—U. S., 3 ; Ont., 3 ; 1st prize, Wm. McNeil ; 5th prize, R. C. Middlemiss.
Cockerel—U. S., 6 ; Ont., 2 ; 1st prize, A. Bogue ; 2nd prize, W. McNeil.
Pullet—U. S., 6 ; Ont., 3 ; 2nd prize, Wm. McNeil ; 4th prize, R. C. Middlemiss ; 8th prize, A. Bogue.

Golden Polish.

Cock—U. S., 2 ; Ont., 3 ; 2nd prize, Wm. McNeil ; 3rd prize, A. Bogue ; 4th prize, G. Bogue.
Hen—U. S., 2 ; Ont., 3 ; 3rd prize, Wm. McNeil ; 4th prize, A Bogue ; 5th prize, G. Bogue.
Cockerel—U. S., 2 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, G. Bogue.
Pullet—U. S., 2 ; Ont., 2 ; 1st prize, G. Bogue ; 2nd prize, Wm. McNeil.

Silver Polish.

Cock—U. S., 0 ; Ont., 1 ; 1st prize, M. T. Burn.
Hen—U. S., 0 ; Ont., 1 ; 1st prize, M. T. Burn.
Cockerel—U. S., 0 ; Ont., 4 ; 1st, 2nd, 3rd and 4th prizes, M. T. Burn.
Pullet—U. S., 0 ; Ont., 4 ; 1st, 2nd, 3rd and 4th prizes, M. T. Burn.

White Polish.

Cock—U. S., 1 ; Ont., 2 ; 1st prize, A Bogue ; 2nd prize, Wm. McNeil.
Hen—U. S., 1 ; Ont., 2 ; 2nd prize, A. Bogue ; 4th prize, Wm. McNeil.
Cockerel—U. S., 0 ; Ont., 2 ; 1st prize, A. Bogue ; 2nd prize, Wm McNeil.
Pullet—U. S., 0 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, A. Bogue.

Bearded Golden Polish.

Cock—U. S., 0; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, A. Bogue.
Hen—U. S., 0 ; Ont., 3 ; 1st prize, Wm. McNeil ; 2nd prize, A. Bogue.
Cockerel—U. S., 0 ; Ont., 2 ; 1st prize, Wm. McNeil ; 3rd prize, A. Bogue.
Pullet—U. S., 0 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, A. Bogue.

Bearded Silver Polish.

Cock—U. S., 0 ; Ont., 3 ; 1st prize, A. Bogue ; 2nd prize, M. T. Burn ; 3rd prize, Wm. McNeil.
Hen—U. S., 1 ; Ont., 2 ; 1st prize, A. Bogue ; 3rd prize, Wm McNeil.
Cockerel—U. S., 0 ; Ont., 2 ; 1st prize, Wm McNeil ; 2nd prize, A. Bogue.
Pullet—U. S., 0 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, A. Bogue.

Bearded White Polish.

Cock—U. S., 0 ; Ont. 2 ; 1st prize, A Bogue ; 3rd prize, Wm. McNeil.
Hen—U. S., 0 ; Ont., 2 ; 2nd prize, Wm. McNeil ; 3rd prize, A. Bogue.
Cockerel—U. S., 0 ; Ont., 2 ; 1st prize, A. Bogue ; 2nd prize, Wm. McNeil.
Pullet—U. S., 0 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, A. Bogue.

Buff Laced Polish.

Cock—U. S., 1 ; Ont., 1 ; 1st prize, Wm. McNeil.
Hen—U. S., 2 ; Ont., 1 ; 3rd prize, Wm. McNeil.
Cockerel—U. S., 0 ; Ont., 1 ; 1st prize, Wm. McNeil.
Pullet—U. S., 1 ; Ont., 1 ; 2nd prize, Wm. McNeil.

Golden Spangled Hamburgs.

Cock—U. S., 2 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, R. Oke.
Hen—U. S., 2 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, R. Oke.
Cockerel—U. S., 0 ; Ont., 2 ; 1st prize, Wm McNeil ; 2nd prize, R. Oke.
Pullet—U. S., 1 ; Ont., 2 ; 2nd prize, Wm. McNeil ; 3rd prize, R. Oke.

Silver Spangled Hamburgs.

Cock—U. S. 2 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, R. Oke.
Hen—U. S., 3 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, R. Oke.
Cockerel—U. S., 6 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, R. Oke.
Pullet—U. S., 6 ; Ont., 2 ; 2nd prize, Wm. McNeil ; 3rd prize, R. Oke.

Golden Penciled Hamburgs.

Cock—U. S., 1 ; Ont., 3 ; 1st prize, Wm. McNeil ; 2nd prize, A. Bogue ; 3rd prize, R. Oke.
Hen—U. S., 1 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, R. Oke.
Cockerel—U. S., 1 ; Ont., 2 ; 1st prize, R. Oke ; 2nd prize, Wm. McNeil.
Pullet—U. S., 1 ; Ont., 2 ; 1st prize, R. Oke ; 2nd prize, Wm. McNeil.

Silver Pencilled Hamburgs.

Cock—U. S., 1 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, R. Oke.
Hen—U. S., 1 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, R. Oke.
Cockerel—U. S., 0 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, R. Oke.
Pullet—U. S., 1 ; Ont., 2 ; 1st prize, R. Oke ; 2nd prize, Wm. McNeil.

Black Hamburgs.

Cock—U. S., 1 ; Ont., 2 ; 1st prize, Wm. McNeil ; 2nd prize, R. Oke.
Hen—U. S., 1 ; Ont., 2 ; 1st prize, R. Oke ; 2nd prize, Wm. McNeil.
Cockerel—U. S., 1 ; Ont., 3 ; 2nd prize, R. Oke ; 3rd prize, M. T. Burn ; 4th prize, Wm. McNeil.
Pullet—U.S., 1 ; Ont., 3 ; 2nd prize, R. Oke ; 3rd prize, Wm. McNeil ; 4th prize, M. T. Burn.

Red Cap.

Cock—U. S., 1; Ont., 2; 1st prize, C. J. Daniels.
Cockerel—U. S., 1; Ont., 4; 2nd and 5th prizes, G. Bogue.
Pullet—U. S., 1; Ont., 3; 1st and 3rd prizes, G. Bogue; 4th prize, C. J. Daniels.

Houdans.

Hen—U. S., 12; Ont., 1; 1st prize, G. Bogue.
Cockerel—U. S., 11; Ont., 1; 3rd prize, G. Bogue.

Crevc Coeurs.

Cock—U. S., 0; Ont., 2; 1st prize, G. Bogue; 2nd prize, R. Oke.
Hen—U. S., 0; Ont, 2; 1st prize, R. Oke; 2nd prize, G. Bogue.
Cockerel—U. S, 0; Ont., 2; 1st prize, R. Oke; 2nd prize, G. Bogue.
Pullet—U. S., 0; Ont., 2; 1st prize, R. Oke; 2nd prize, G. Bogue.

La Fleche.

Cock—U. S, 1; Ont., 2; 1st prize, R. Oke; 3rd prize, J. H. Warrington.
Hen—U. S., 1; Ont., 3; 1st prize. R. Oke; 2nd prize, G. Bogue; 4th prize, J. H. Warrington.
Cockerel—U. S., 1; Ont., 2; 2nd prize, R. Oke; 3rd prize, G. Bogue.
Pullet—U. S., 1; Ont., 2; 2nd prize, R. Oke; 3rd prize. J. H. Warrington.

White Dorkings.

Cock—U. S., 2; Ont., 3; 4th prize, J. H. Warrington.
Hen—U. S., 3; Ont, 4; 1st and 3rd prizes, J H. Warrington; 4th prize, A. Bogue.
Cockerel—U. S, 1; Ont, 3; 1st prize, A. Bogue.
Pullet—U. S., 1; Ont., 4; 2nd prize, J. H. Warrington.

Silver Grey Dorkings.

Cock—U. S., 4; Ont., 4; 4th prize, S. D. Furminger; 5th prize, A. C. Wells; 6th prize, A Bogue.
Hen—U. S., 5; Ont., 5; 5th prize, A. Bogue.
Pullet—U. S., 7; Ont., 3; 6th prize, A. Bogue.

Colored Dorkings.

Cock—U. S., 1; Ont., 1; 1st prize, A. Bogue.
Hen—U. S., 1; Ont., 2; 1st prize, S. D. Furminger; 2nd prize, A. Bogue.
Cockerel—U. S., 1; Ont., 2; 1st prize, A Bogue; 2nd prize, S. D. Furminger.
Pullet—U. S., 1; Ont., 1; 1st prize, A. Bogue.

Black Breasted Red Game.

Cock—U. S., 4; Ont., 5; 1st and 3rd prizes, Jas Morley; 5th and 8th prizes, John Crowe; 6th prize, Wm. Barker & Co.
Hen—U. S., 3; Ont., 4; 1st and 2nd prizes, Jas Morley; 5th and 7th prizes, J. Crowe.
Cockerel U. S., 2; Ont., 5; 2nd and 3rd prizes, Jas Morley; 4th and 5th prizes, John Crowe.
Pullet—U. S, 1; Ont, 5; 1st and 3rd prizes, Jas. Crowe; 2nd prize, W. Barber & Co.; 4th and 6th prizes Jas. Morley.

Brown Red Game.

Cock—U. S, 3; Ont, 3; 1st and 5th prizes, John Crowe; 3rd prize, W. Barber & Co.
Hen—U. S., 3; Ont., 3; 2nd prize, Wm. Barber; 4th and 6th prizes, John Crowe.
Cockerel—U. S. 2; Ont, 4; 1st and 2nd prizes, John Crowe; 4th prize, W. Barber; 6th prize, W. J. Teale.
Pullet—U. S., 3; Ont., 3; 3rd and 4th prizes, John Crowe; 6th prize, W. J. Teale.

Silver Duckwing Game.

Cock—U. S., 2; Ont., 1; 2nd prize, W. Barber & Co.
Hen—U. S., 3; Ont, 1; 1st prize, W. Barber & Co.
Cockerel—U. S., 2; Ont., 2; 1st and 2nd prizes, W. Barber & Co.
Pullet—U S., 3; Ont., 2; 1st and 2nd prizes, W. Barber & Co.

Golden Duckwing Game.

Cock—U. S., 1; Ont., 1; 1st prize, W. Barber & Co.
Hen—U. S., 1; Ont., 1; 1st prize, W. Barber & Co.
Cockerel—U. S., 4; Ont., 1; 2nd prize, W. Barber & Co.
Pullet—U. S., 3; Ont., 1; 1st prize, Wm. Barber & Co.

Red Pyle Game.

Cock—U. S., 3; Ont, 3; 1st prize, John Crowe; 2nd prize, W. Barber.
Hen—U. S., 4; Ont., 4; 1st prize, W. Barber; 3rd prize, John Crowe.
Cockerel—U. S., 2; Ont. 2; 1st prize, John Crowe.
Pullet—U. S., 2; Ont., 4; 6th prize, W. Barber & Co; 1st and 4th prizes, John Crowe.

Birchen Game.

Pullet—U. S., 1; Ont., 1; 2rd prize, W. Barber & Co.

Malay Game

Cock—U. S., 0; Ont., 1; 1st prize, M. T. Burn.
Hen—U. S., 0; Ont., 1; 1st prize, M. T. Burn.
Cockerel—U. S., 0; Ont., 1; 1st prize, M. T. Burn.
Pullet—U. S., 0; Ont., 2; 1st and 2nd prizes, M. T. Burn.

Black Sumatra Game.

Cock—U. S., 2; Ont., 3; 1st prize, M. T. Burn; 2nd prize, A. Patton; 3rd prize, C. J. Daniels.
Hen—U. S., 2; Ont., 4; 1st and 4th prizes, C. J. Daniels; 3rd prize, A. Patton; 6th prize, M. T. Burn.
Cockerel—U. S., 0; Ont., 2; 1st prize, C. J. Daniels; 3rd prize, A. Patton.
Pullet—U. S., 1; Ont., 2; 2nd prize, C. J. Daniels; 3rd prize, A. Patton.

Black Breasted Red Game Bantams.

Cock—U. S., 5; Ont., 4; 2nd prize, W. Hammil; 3rd prize, W. Barber; 7th prize, Chas. Crowe; 8th prize, S. D. Furminger.
Hen—U. S., 6; Ont., 3; 1st prize, Wm. Barber; 7th prize, Chas. Crowe; 8th Prize, Wm. Hammil.
Cockerel—U. S., 6; Ont., 6; 1st and 2nd prizes, Wm. Barber; 4th and 5th prizes, Chas. Crowe; 6th prize, S. D. Furminger; 8th prize, W. J. Teale.
Pullet—U. S., 8; Ont., 7; 1st and 3rd prizes, W. Barber & Co.; 4th and 8th prizes, Chas. Crowe.

Brown Red Game Bantams.

Cock—U. S., 3; Ont., 3; 1st and 5th prizes, W. Barber & Co.; 6th prize, H. B. Donovan.
Hen—U. S., 2; Ont., 3; 3rd prize, Wm. Hammil; 4th prize, H. B. Donovan; 5th prize, W. Barber & Co.
Cockerel—U. S., 2; Ont., 1; 2nd prize, W. Barber & Co.
Pullet—U. S., 2; Ont., 2; 2nd prize, W. Barber & Co.; 3rd prize, H. B. Donovan.

Silver Duckwing Game Bantams.

Hen—U. S., 2; Ont., 1; 2nd prize, W. Barber & Co.
Cockerel—U. S., 4; Ont., 1; 1st prize, W. Barber & Co.
Pullet—U. S., 4; Ont., 1; 2nd prize, W. Barber & Co.

Golden Duckwing Game Bantams.

Cock—U. S., 1; Ont., 1; 1st prize, W. Barber & Co.
Hen—U. S., 1; Ont., 2; 1st and 3rd prizes, W. Barber & Co.
Cockerel—U. S., 5; Ont., 5; 1st and 3rd prizes, W. Barber & Co.; 2nd prize, Wm. Hammil; 5th prize, Chas. Crowe; 4th prize, L. McIntyre.
Pullet—U. S., 1; Ont., 5; 1st and 5th, Wm. Barber & Co.; 2nd prize, L. McIntyre; 3rd prize, Wm. Hammil; 4th prize, Chas. Crowe.

Red Pyle Game Bantams.

Cock—U. S., 3; Ont., 4; 4th prize, W. Barber & Co.; 5th prize, L. McIntyre.
Hen—U. S., 3; Ont., 5; 4th and 5th prizes, W. Barber & Co; 6th prize, Jas. Crowe; 7th prize, Wm. Hammill; 8th prize, L. McIntyre.
Cockerel—U. S., 4; Ont., 3; 3rd prize, W. Barber; 5th prize, W. J. Teale.
Pullet—U. S., 5; Ont., 3; 1st prize, Chas. R. Crowe; 6th prize, Wm. Barber & Co.; 7th prize, W. J. Teale.

Birchen Game Bantams.

Cock—U. S., 2; Ont., 2; 3rd prize, H. B. Donovan.
Hen—U. S., 2; Ont., 2; 3rd and 4th prizes, H. B. Donovan.
Cockerel—U. S., 4; Ont., 2; 2nd and 4th prizes, S. D. Furminger.
Pullet—U. S., 3; Ont., 1; 3rd prize, H. B. Donovan.

Any other variety Game Bantams.

Cock—U. S., 2; Ont., 2; 3rd prize, H. B. Donovan.
Hen—U. S., 3; Ont., 3; 2nd and 5th prizes, H. B. Donovan; 6th prize, H. Emerick.
Cockerel—U. S., 1; Ont., 3; 2nd and 3rd prizes; H. B. Donovan; 4th prize, H. Emerick.
Pullet—U. S., 3; Ont., 3; 1st and 2nd prizes, H. B. Donovan; 6th prize, H. Emerick.

Golden Sebright Bantams.

Cock—U. S., 8; Ont., 2; 3rd prize, R. Oke.
Hen—U. S., 7; Ont., 2; 5th prize, R. Oke; 8th prize, Wm. McNeil.
Cockerel—U. S., 7; Ont., 3; 3rd prize, R. Oke; 4th prize, Wm. McNeil.
Pullet—U. S., 7; Ont., 3; 5th prize, R. Oke; 6th prize, Wm. McNeil.

Silver Sebright Bantams.

Cock—U. S., 6; Ont., 2; 3rd prize, Wm. McNeil; 4th prize, R. Oke.
Hen—U. S., 7; Ont., 2; 3rd prize, R. Oke; 6th prize, Wm. McNeil.
Cockerel—U. S., 6; Ont., 2; 4th prize, R. Oke.
Pullet—U. S., 7; Ont., 2; 2nd prize, Wm. McNeil; 6th prize, R. Oke.

P. C. Black Bantams

Cock—U.S., 7; Ont., 4.
Hen—U S., 5; Ont., 4; 4th prize, Wm. McNeil; 6th prize, R. Oke
Cockerel—U.S., 2; Ont., 3; 1st prize, R. Oke; 3rd prize, Wm. McNeil; 4th prize, H. Emerick.
Pullet—U.S., 3; Ont., 3; 1st prize, R. Oke; 3rd prize, Wm McNeil; 5th prize, H. Emerick.

R. C. White Bantams.

Cock—U.S., 1; Ont., 3; 2nd and 3rd prizes, H. B. Donovan; 4th prize R. Oke.
Hen—U.S., 2; Ont, 3; 1st prize, R. Oke; 2nd and 4th prizes, H. B. Donovan.
Cockerel—U.S., 0; Ont., 3; 1st prize, R Oke; 2nd and 3rd prizes, H. B Donovan.
Pullet—U.S., 0; Ont., 3; 1st prize, R. Oke; 2nd and 3rd prizes, H. B. Donovan.

White Booted Bantams.

Cock—U.S., 0; Ont., 2; 1st prize, H. B. Donovan; 2nd prize, R. Oke.
Hen—U.S., 0; Ont., 2; 1st prize, H. B. Donovan; 2nd prize, R Oke.
Cockerel—U.S., 0; Ont., 2; 1st prize, H. B. Donovan; 2nd prize, R Oke.
Pullet—U.S, 0; Ont, 2; 1st prize, R Oke; 2nd prize, H. B. Donovan.

Black Tailed Japanese Bantams.

Cock—U.S, 1; Ont, 2; 1st prize, R. Oke; 3rd prize, Wm McNeil.
Cockerel—U.S., 1; Ont., 3; 2nd prize, R. Oke; 3rd prize, Wm. McNeil; 4th prize, H. B. Donovan.
Pullet—U.S, 1; Ont, 4; 2nd prize, R. Oke; 3rd prize M. T. Burn.

White Japanese Bantams.

Cock—U.S. 0; Ont., 4; 1st prize, R. Oke; 2nd, Wm. McNeil; 3rd prize, H. B. Donovan
Hen—U.S., 1; Ont., 4; 1st prize, M. T. Burn; 3rd prize, R. Oke; 4th prize, H. B. Donovan.
Cockerel—U.S., 0; Ont., 3; 1st prize, R. Oke; 2nd prize, Wm. McNeil; 3rd prize, H. B. Donovan.
Pullet—U.S., 1; Ont., 3; 1st prize, R. Oke; 3rd prize, Wm. McNeil; 4th prize, H. B. Donovan.

Black Japanese Bantams.

Hen—U.S., 0; Ont., 2; 1st prize, H. B. Donovan; 2nd prize, R. Oke.
Cockerel—U.S., 0; Ont, 1; 1st prize, R. Oke.
Pullet—U.S, 0; Ont., 1; 1st prize, R. Oke.

Buff Cochin Bantams.

Cock—U.S., 7; Ont., 3; 4 h prize, Wm. McNeil; 8th prize, R. Oke.
Cockerel—U.S., 8; Ont, 2; 3rd prize, Wm. McNeil; 4th prize, R. Oke.
Pullet—U.S., 8; Ont., 2; 1st prize, Wm. McNeil; 4th prize, R. Oke.

White Cochin Bantams.

Cock—U.S., 4; Ont., 3; 1st prize, Geo Colwell; 2nd prize, Wm. McNeil.
Hen—U.S., 6; Ont., 4; 1st prize, Wm. McNeil; 2nd prize, Geo. Colwell.
Cockerel—U.S, 3; Ont., 5; 1st prize, Wm McNeil; 2nd prize, Geo. Colwell.
Pullet—U.S., 3; Ont., 5; 2nd prize, Geo. Colwell.

Black Cochin Bantams.

Hen—U.S., 6; Ont., 2; 1st prize, R. Oke; 7th prize, W. J. Teale.
Cockerel—U.S., 6; Ont., 1; 3rd prize, L. McIntosh.
Pullet—U.S., 6; Ont., 3; 6th prize, L. McIntosh; 8th prize, W. J. Teale.

White Crested Polish Bantams.

Cock—U.S., 0; Ont., 3; 1st prize, Wm. McNeil.
Hen—U.S., 0; Ont, 4; 1st prize, R. Oke; 2nd prize, H. B. Donovan; 3rd prize, Wm. McNeil.
Cockerel—U.S., 0; Ont, 4; 1st prize, R. Oke; 2nd prize, H. B. Donovan.
Pullet—U.S., 0; Ont., 4; 1st prize, Wm. McNeil; 2nd prize, H. B. Donovan; 3rd prize, R. Oke.

Bearded White Polish Bantams.

Cock—U.S., 0; Ont., 1; 1st prize, Wm. McNeil.
Hen—U.S., 0; Ont., 1; 1st prize, Wm McNeil.
Cockerel—U.S., 0; Ont., 1; 1st prize, Wm. McNeil.
Pullet—U.S., 0; Ont., 1; 1st prize, Wm. McNeil.

Buff Orpingtons.

Cock—U. S., 5; Ont., 1; 5th prize, S. D. Furminger.
Hen—U. S., 4; Ont., 1; 4th prize, S. D. Furminger.
Cockerel—U. S., 6; Ont., 2; 6th prize. C. J Daniels.
Pullet—U. S., 6; Ont, 2; 2nd prize, C. J. Daniels; 6th prize, S. D. Furminger.

Black Orpingtons.

Cock—U. S., 0; Ont., 1; 1st prize, S. D. Furminger.
Hen—U. S., 0; Ont., 1; 1st prize, S. D. Furminger.
Cockerel—U. S., 0; Ont., 1; 1st prize, S. D. Furminger.
Pullet—U. S., 0; Ont., 1; 1st prize S. D. Furminger.

Silkies.

Cock—U. S., 1; Ont., 3; 1st prize, Wm. McNeil; 4th prize, C. J. Daniels; 5th prize, H. B. Donovan.
Hen—U. S., 1; Ont., 3; 2nd prize, Wm. McNeil; 3rd prize, H. B. Donovan; 5th prize, C. J. Daniels.
Cockerel—U. S., 1; Ont., 4; 1st prize, Wm. McNeil; 3rd and 4th prizes, H. B. Donovan.
Pullet—U. S., 1; Ont., 4; 3rd prize, Wm. McNeil; 4th and 5th prizes, H. B. Donovan.

Sultans.

Cock—U. S., 0; Ont, 1; 1st prize, R. Oke.
Hen—U. S., 0; Ont., 1; 1st prize, R. Oke.
Cockerel—U. S., 0; Ont., 1; 1st prize, R. Oke.
Pullet—U. S., 0; Ont., 1; 1st prize, R. Oke.

Black Booted.

Cock—U. S., 0; Ont., 1; 1st prize, R. Oke.
Hen—U. S., 0; Ont., 1; 1st prize, R. Oke.

TURKEYS

Bronze prior to 1900.

Male—U. S., 5; Ont, 2; 2nd prize, W. H. Beattie.
Female—U. S. 7; Ont., 2; 2nd prize, W. J. Bell.

Bronze, 1900.

Male—U. S., 4; Ont, 2; 2nd prize, W. H. Beattie.
Female—U. S., 6; Ont., 2; 2nd prize, W. H. Beattie; 3rd prize, W. J. Bell.

Bronze, 1901.

Male—U. S., 4; Ont, 2; 1st prize, W. J. Bell.
Female—U. S., 4; Ont., 2; 3rd prize, W. H. Beattie; 4th, W. J. Bell.

White Turkeys, prior to 1900.

Male—U. S., 2; Ont., 1; 1st prize, W. H. Beattie.
Female—U. S., 1; Ont., 1; 1st prize, W. H. Beattie.

White Turkeys, 1900.

Male—U. S., 1; Ont., 2; 2nd and 3rd prizes, W. H. Beattie.
Female—U.S., 1; Ont., 2; 1st and 2nd prizes, W. H. Beattie.

Slate Turkeys.

Male—U. S, 0; Ont., 1; 1st prize, W. H. Beattie.
Female—U. S., 0; Ont., 1; 1st prize, W. H. Beattie.

DUCKS.

Pekin.

Male—U. S., 11; Ont., 2; 1st prize, Geo. Colwell, 4th prize, A. Bogue.
Female—U. S., 11; Ont., 2; 1st prize, Geo. Colwell.

Aylesbury.

Male—U. S., 2; Ont., 5; 2nd and 4th prizes, Geo. Colwell; 1st prize, M. T. Burn; 6th prize, W. J. Teale.
Female—U. S., 2; Ont., 5; 1st and 6th prizes, Geo. Colwell; 2ad prize, M. T. Burn; 3rd prize, W. J. Teale.

Rouen.

Male—U. S., 2; Ont., 4; 1st and 3rd prizes, Geo. Colwell; 4th prize, A. Bogue; 5th prize, M. T. Burn.
Female—U. S., 3; Ont., 4; 1st and 4th prizes, Geo. Colwell; 3rd prize, M. T. Burn; 6th prize, A. Bogue.

Cayuga.

Male—U. S., 2; Ont., 2; 1st and 2nd prizes, W. J. Teale.
Female—U. S., 2; Ont., 2; 1st and 2nd prizes, W. J. Teale.

Grey Call.

Male—U. S., 2; Ont., 2; 2nd prize, M. T. Burn; 4th prize, H. B. Donovan.
Female—U. S., 2; Ont., 2; 2nd prize, M. T. Burn; 3rd prize, H. B. Donovan.

White Call.

Male—U. S., 0; Ont., 1; 1st prize, H. B. Donovan.
Female—U. S., 0; Ont., 1; 1st prize, H. B. Donovan.

East India.

Male—U. S., 1; Ont. 1; 1st prize, M. T. Burn.
Female—U. S., 2; Ont., 1; 1st prize, M. T. Burn.

Crested White.

Male U. S., 2; Ont., 1; 3rd prize, M. T. Burn.
Female—U.S., 2; Ont., 1; 3rd prize, M. T. Burn.

Indian Runner.

Male—U. S., 0; Ont., 2; 1st prize, S. D. Farminger; 2nd prize, M. T. Burn.
Female—U. S., 1; Ont., 2, 1st prize, S. D. Furminger; 2nd Prize, M. T. Burn.

White Muscovia.

Male—U. S., 2; Ont., 1; 3rd prize, M. T. Burn.
Female—U. S., 2; Ont., 1; 3rd prize, M. T. Burn.

GEESE.

Toulouse.

Male—U. S., 5; Ont., 2; 1st prize, Geo. Colwell; 4th prize, A. Bogue.
Female—U. S., 5; Ont., 2; 4th prize, Geo. Colwell.

Embden.

Male—U. S., 2; Ont., 1; 1st prize, Geo. Colwell.
Female—U. S., 2; Ont., 1; 2nd prize, Geo. Colwell.

African.

Male—U. S., 1; Ont., 1; 1st prize, M. T. Burn.
Female—U. S., 0; Ont., 1; 1st prize, M. T. Burn.

Brown China.

Male—U. S., 2; Ont., 2; 2nd prize, M. T. Burn; 4th prize, Geo. Colwell.
Female—U. S., 2; Ont., 2; 1st prize, Geo. Colwell; 3rd prize, M. T. Burn.

Wild or Canadian Geese.

Male—U. S., 2; Ont., 1; 2nd prize, M. T. Burn.
Female—U. S., Ont., 2; Ont., 1; 3rd prize, M. T. Burn.

Egyptian Geese.

Male—U. S., 0; Ont., 1; 1st prize, M. T. Burn.
Female—U. S., 0; Ont., 1; 1st prize, M. T. Burn.

GUINEA.

Pearl Guinea.

Male—U.S., 1; Ont., 1; 2nd prize, M. T. Burn.
Female—U.S., 1; Ont., 1; 1st prize, M. T. Burn.

White Guinea.

Male—U.S., 1; Ont., 2; 1st prize, M. T. Burn; 3rd prize, C. J. Daniels.
Female—U.S., 1; Ont., 2; 2nd prize, C. J. Daniels; 3rd prize, M. T. Burn.

Pea Fowl.

Male—U.S., 1; Ont., 1; 1st prize, M. T. Burn.
Female—U.S., 1; Ont., 1; 2nd prize, M. T. Burn.

PHEASANTS.

Golden.

Male—U.S., 2; Ont., 3; 3rd prize, H. B. Donovan.
Female—U.S., 2; Ont., 3; 3rd prize, H. B. Donovan.

Silver.

Male—U.S., 1; Ont., 1; 2nd prize, H. B. Donovan.

Ring Neck.

Male—U.S., 1; Ont., 1; 2nd prize, H. B. Donovan.
Female—U.S., 1; Ont., 1; 2nd prize, H. B. Donovan.

Mandarin Ducks.

Male—U.S., 0; Ont., 1; 1st prize, H. B. Donovan.
Female—U.S., 0; Ont., 2; 1st and 2nd prizes, H. B. Donovan.

Wood Ducks.

Male—U.S., 0; Ont., 2; 1st prize, M. T. Burn; 2nd prize, H. B. Donovan.
Female—U.S., 0; Ont., 2; 1st prize, M. T. Burn; 2nd prize, H. B. Donovan.

A. O. V. Ornamental.

Male—U.S., 1; Ont., 3; 2nd prize, M. T. Burn.

Breeding Pens.

Barred Plymouth Rocks—U.S., 8; Ont., 2; 6th prize, Newton Cosh & Co.; 8th prize, I. K. Millard.
Silver Wyandottes—U.S., 2; Ont., 2; 3rd prize, Jas. Arthur; 4th prize, C. J. Daniels.
Golden Wyandottes—U.S., 1; Ont., 2; 2nd prize, C. J. Daniels; 3rd prize, J. W. Saunders.
Dark Brahmas—U.S., 0; Ont., 2; 1st prize, Thorpe & Scott; 2nd prize, L. C. Sage.
Buff Cochins—U.S., 1; Ont., 1; 1st prize, Chas. A. Stewart.
Partridge Cochins—U.S., 0; Ont., 1; 1st prize, Mrs. S. Butterfield.
White Cochins—U.S., 0; Ont., 1; 1st prize, Latta Bros.
Black Cochins—U.S., 0; Ont., 1; 1st prize, Latta Bros.
Black Langshans—U.S., 2; Ont., 1; 1st prize, McCurdy Bros.
Buff Leghorns—U.S., 6; Ont., 2; 1st prize, G. Berner; 4th prize, Jas. Dundas.
Blue Andalusians—U.S., 0; Ont., 1; 1st prize, Newton Cosh & Co.
White Crested Black Polish—U.S., 3; Ont., 2; 1st prize, R. C. Middlemiss; 2nd prize, Wm. McNeil
Silver Polish—U.S., 0; Ont., 1; 1st prize, M. T. Burn.
Bearded Silver Polish—U.S., 0; Ont., 1; 1st prize, Wm. McNeil
Bearded White Polish—U.S., 0; Ont., 1; 1st prize, Wm. McNeil.
Buff Laced Polish—U.S., 0; Ont., 1, 1st prize, Wm. McNeil.
Golden Spangled Hamburgs—U.S., 0; Ont., 1; 1st prize, Wm, McNeil.
Golden Pencilled Hamburgs—U.S., 0; Ont., 2; 1st prize, R. Oke; 2nd prize, Wm. McNeil.
Silver Pencilled Hamburgs—U.S., 0; Ont., 1; 1st prize, Wm. McNeil.
Black Hamburgs—U.S., 0; Ont., 1; 1st prize, Wm. McNeil.
White Dorkings—U.S., 0; Ont., 1; 1st prize, Allan Bogue.
B.B.B. Red Game Bantams—U.S., 0; Ont., 1; 1st prize, Wm. Hammill.
Golden Seabright Bantams—U.S., 2; Ont., 2; 2nd prize, R. Oke; 4th prize, Wm. McNeil.
Silver Seabright Bantams—U.S., 1; Ont., 1; 2nd prize, Wm. McNeil.
Rose Comb Black Bantams—U.S., 0; Ont., 2; 1st prize, R. Oke; 2nd prize, Wm. McNeil.
White Booted Bantams—U.S., 0; Ont., 1; 1st prize, R. Oke.
Black Tail Japanese Bantams—U.S., 0; Ont., 1; 1st prize, Wm. McNeil.
White Japanese Bantams—U.S., 0; Ont., 1; 1st prize, Wm. McNeil.
White Cochin Bantams—U.S., 1; Ont., 3; 1st prize, Geo. Colwell; 4th prize, Wm. McNeil.
W.C. White Polish Bantams—U.S., 0; Ont., 1; 1st prize, Wm. McNeil.
Bearded White Polish Bantams—U.S., 0; Ont., 1; 1st prize, Wm. McNeil.
Cayuga Ducks—U.S., 0; Ont., 1; 1st prize, W. J. Teale.
Indian Runner Ducks—U.S., 1; Ont., 1; 1st prize, S. D. Furminger.

PIGEONS.

White Pigmy.

Cocks—U.S., 3; Ont., 1; 4th prize, H. B. Donovan.
Hens—U.S., 2, Ont., 1; 2nd prize, H. B. Donovan.
Cocks, 1901—U.S., 1; Ont., 1; 2nd prize, H. B. Donovan.
Hens, 1901—U.S., 1; Ont., 1; 2nd prize, H. B. Donovan.

Black Carriers.

Hens—U.S., 2; Ont., 2; 3rd prize, H. B. Donovan.
1901—U.S., 5; Ont., 2; 5th prize, H. B. Donovan.

Dun Carriers.

Cocks—U.S., 1; Ont., 2; 2nd prize, H. B. Donovan.

Black Barbs.

Cock—U.S., 9; Ont., 1; 1st prize, H. B. Donovan.

Red Barbs.

Hen—U.S., 1; Ont., 1; 1st prize, H. B. Donovan.

Almond S. F. Tumblers.

Cocks—U.S., 3; Ont., 2; 3rd and 4th prizes, H B. Donovan.
Hens—U.S., 6; Ont., 2; 2nd prize, H. B. Donovan.

Self or Kite S. F. Tumblers.

Cocks—U.S., 3; Ont.. 2; 3rd and 5th prizes, H. B. Donovan.
Hens—U.S., 3; Ont., 2; 4th and 5th prizes, H. B. Donovan.
1901—U.S., 2; Ont., 1; 3rd prize, H. B. Donovan.

A. O. C. Short Face Tumblers.

Cocks—U S., 2; Ont., 2; 3rd and 4th prizes, H. B. Donovan.
Hens—U.S., 0; Ont., 2; 1st and 2nd prizes, H. B. Donovan.

Blue Jacobins.

Cock, 1901—U.S., 6; Ont., 1; 4th prize, R. K. Barker.
Hen, 1901—U.S., 5; Ont, 1; 6th prize, R. K. Barker.

Red Jacobins.

Hen—U.S., 5; Ont, 2; 6th prize, R. K. Barker; 7th prize, W. J. Teale.

Silver English Owls.

Cocks—U.S., 7; Ont., 1; 7th prize, H. B. Donovan.
Hens—U.S., 7; Ont, 1; 5th prize, H. B. Donovan.

Black-Red English Owls.

Cocks—U.S., 4; Ont., 2; 3rd and 6th prizes, H. B. Donovan.
Hens—U.S, 3; Ont., 2; 4th and 5th prizes, H. B. Donovan.

A. O. C. English Owls.

Cocks—U.S., 3; Ont., 2; 2nd and 3rd prizes, H. B. Donovan.
Hens—U.S., 3; Ont., 2; 3rd and 4th prizes, H. B. Donovan.

Blue African Owls.

Hens—U.S., 8; Ont., 1; 8th prize, H. B. Donovan.

Black African Owls.

Cocks—U.S., 6; Ont., 1; 7th prize, H. B. Donovan.

Oriental Turbits.

Cocks—U.S., 6; Ont., 2; 6th prize, H. B. Donovan.
Hens—U.S., 6; Ont., 2; 3rd prize, H. B. Donovan.

Black Turbits.

Cocks—U.S., 4; Ont., 2; 5th prize, H. B. Donovan.
Hens—U.S., 3; Ont., 1; 4th prize, H. B. Donovan.

Blue Turbits.

Cocks—U.S, 3; Ont., 3; 4th and 5th prizes, H. B. Donovan.
1901—U.S., 0; Ont., 2; 1st and 2nd prizes, H. B. Donovan.

Yellow Turbits.

Cocks—U.S., 2; Ont, 2; 1st and 2nd prizes, H. B. Donovan.
Hens—U.S., 2; Ont., 2; 1st prize, H. B. Donovan.

Blue or Dun Nun.

Cock or Hen—U.S., 4; Ont., 2; 5th and 6th prizes, H. B. Donovan.

A. O. C. Nun.

Cock or Hen—U.S., 4; Ont., 2; 5th and 6th prizes, H. B. Donovan.
German Beards—U.S., 0; Ont., 4; 1st, 2nd, 3rd and 4th prizes, H. B. Donovan.
Colored Ring Doves—U.S., 0; Ont., 4; 1st, 2nd, 3rd and 4th prizes, H. B. Donovan.
White Java Doves—U.S, 0; Ont., 4; 1st, 2nd, 3rd and 4th prizes, H. B. Donovan.
A. O. V. Doves—U.S, 0; Ont., 4; 1st, 2nd, 3rd and 4th prizes, H. B. Donovan.

Short Face Antwerps.

Cocks—U.S., 1; Ont., 4; 2nd, 3rd, 4th and 5th prizes, H. B. Donovan.
Hens—U.S., 1; Ont., 4; 1st, 3rd and 5th prizes, H. B. Donovan.

Long Face Antwerps.

Cocks—U S., 1 ; Ont , 4 ; 1st, 2od and 3rd prizes, H. B. Donovan.
Hens—U.S., 1 ; Ont., 4 ; 1st, 2nd and 3rd prizes, H. B. Donovan.

Antwerps.

1901—U.S., 0; Ont., 4 ; 1st, 2nd, 3rd and 4th prizes, H. B Donovan.

PET STOCK.

Belgian Hares—Imported Reds.

Adult Buck—U. S., 8 ; Ont., 3 ; 4th prize, Wm. Fox.
Adult Doe—U. S., 15 ; Ont., 3 ; 3rd and 5th prizes, Wm. Fox.

Imported Reds—Heavyweight.

Adult Buck—U. S., 0 ; Ont., 1 ; 1st, E. J. Dewey.
Adult Doe—U. S., 0 ; Ont., 1 ; 1st. E. J. Dewey.

Lop-Eared Rabbits.

Doe with litter under eight weeks—U. S., 0 ; Ont., 3 ; 1st, 2nd and 3rd prizes, Wm. Fox.
Adult Buck—U. S., 0 ; Ont , 3 ; 1st, 2nd and 3rd prizes. Wm. Fox.
Adult Doe—U. S., 0 ; Ont., 3 ; 1st, 2nd and 3rd prizes, Wm. Fox.

Himalayan Rabbits.

Adult Buck—U. S., 1 ; Ont , 2 ; 1st and 2nd prizes, Wm. Fox.
Adult Doe—U. S., 1 ; Ont , 2 ; 1st prize, Wm. Fox.
Buck under six months—U. S , 3 ; Ont., 2 ; 1st and 3rd prizes, Wm. Fox.
Doe under six months—U. S., 1 ; Ont , 2 ; 1st and 2nd prizes, Wm. Fox.

English Rabbits.

Adult Buck—U. S.. 0 ; Ont., 2 ; 1st and 2nd prizes, Wm. Fox.
Adult Doe—U. S., 0 ; Ont., 2 ; 1st and 2nd prizes, Wm. Fox.

Dutch Rabbits.

Adult Buck—U. S., 0 : Ont.. 2 : 1st and 2nd prizes, Wm. Fox.
Adult Doe—U. S , 0 ; Ont., 2 ; 1st and 2nd prizes, Wm. Fox.
Doe under six months—U. S , 0 ; Ont., 1 ; 1st prize, Wm. Fox.

Black and Tan Rabbits.

Adult Buck—U. S., 1 ; Ont , 2 ; 1st and 3rd prizes, Wm. Fox.
Adult Doe—U. S., 1 ; Ont., 2 ; 1st and 3rd prizes, Wm. Fox.

CAVIES (GUINEA PIGS).

White Peruvians.

Boar—U. S., 0 ; Ont., 2 : 1st and 2nd prizes, Wm Fox.
Sow—U. S., 1 ; Ont., 2 ; 2nd and 3rd prizes, Wm. Fox.

Broken or any other color, Peruvians.

Boar—U. S., 1 ; Ont., 3 ; 2nd, 3rd and 4th prizes, Wm. Fox.
Sow—U. S., 0 ; Ont., 3 ; 1st, 2nd and 3rd prizes, Wm. Fox.

Self, any other color, Abyssinian.

Boar—U. S., 2 ; Ont., 2 ; 1st and 2nd prizes, Wm. Fox.
Sow—U. S., 1 ; Ont., 2 ; 2nd and 3rd prizes, Wm. Fox.

Broken, any other color, Abyssinian.

Boar—U. S., 2 ; Ont., 2 ; 1st and 2nd prizes, Wm Fox.
Sow—U. S , 1 ; Ont., 2 ; 1st and 2nd prizes, Wm. Fox.

White English or Smooth Coated.

Boar—U. S., 0 ; Ont., 1 ; 1st prize, Wm. Fox.
Sow—U. S., 1 ; Ont., 2 ; 1st and 2nd prizes, Wm. Fox.

Black English or Smooth Coated.

Boar—U. S., 0 ; Ont., 2 ; 1st and 2nd prizes, Wm. Fox.
Sow——U. S., 0 ; Ont., 2 ; 1st and 2nd prizes, Wm. Fox.

Self Agouti, any color.

Boar—U. S., 1 ; Ont., 1 ; 1st prize, Wm. Fox.
Sow—U. S., 1 ; Ont., 1 ; 1st prize, Wm. Fox.

Self, any other color, Smooth Coated.

Boar—U. S., 7 ; Ont., 2 ; 5th prize, Wm. Fox.

Broken, any other color, Smooth Coated.

Boar—U. S., 2 ; Ont., 3 ; 1st, 2nd and 3rd prizes, Wm. Fox.
Sow—U. S., 3 ; Ont., 3 ; 2nd, 3rd and 6th prizes, Wm. Fox.

MODEL DAIRY.

The object of the Dairy was to ascertain the results to be obtained from the different breeds of dairy cattle under given conditions. There were ten breeds entered, and each herd was composed of five animals. Five of the herds were from Canada, three of these, the Jerseys, Short Horns and Holsteins were supplied from Ontario, while the Ayrshires and French Canadian Cattle were from Quebec. The other five breeds, namely : Guernseys, Dutch Belted, Red Polled, Brown Swiss, and Polled Jerseys, were supplied by the United States. As with the general exhibits the expenses of inspection and transportation of Canadian cows were borne by the Ontario and Dominion Departments of Agriculture.

Four prizes were awarded as follows :—

I. To the herd showing the greatest net profit, butter fat alone considered, as determined by the Babcock test.

II. To the herd showing the greatest net profit, butter alone considered, as determined by the churn.

III. To the herd showing the greatest net profit in total solids.

IV. To the herd showing the greatest net profit in total solids and in loss and gain in live weight.

Each cow's milk was weighed and two samples taken of it, one for a lactometer test, which was made each day to determine the solids, and one for a Babcock test, which was made from the composite sample once each week to determine the per cent. of fat in the milk. The cream from one day's milkings of each herd was churned once each week and the week's yield of butter computed therefrom. During the first five days of the test each cow was weighed every morning and the average of these weighings was considered the initial weight. To ascertain the final weight, each cow was weighed on five consecutive mornings during the last week of the test and the average of these taken.

All the cows in the Canadian herds and those in one of the American herds were milked three times each day during the six months. The remainder of the American herds were milked three times each day until the hot weather, when the number of milkings were reduced to two each day. It was found that the cows when changed from three to two milkings failed more in their milk than did those that were milked three times a day throughout the whole test.

The products of the Dairy were valued as follows :—

Butter.....25 cents per pound.

Butter fat on the basis of 85 % fat in butter.

Total solids .....9 cents per pound.

The loss or gain in live weight was computed at three cents per pound.

In conducting the test the feed furnished each cow was carefully weighed and charged her at the following prices :—

Oil meal	$20 00 per ton	Gluten food	$16 00 per ton
Bran	15 00 "	Pea meal	25 00 "
Ground oats	18 00 "	Clover hay	7 00 "
Cotton seed meal	25 00 "	Ensilage	2 00 "
Corn meal	16 00 "	Green feed	1 75 "

These prices were estimated to be the average prices in Canada and the United States during the past five years.

Prize No. I. was won by the Guernseys (United States) with a net profit of $229.85.

Prize No. II. was won by the Jerseys (Ontario) with a net profit of $173.81, but was awarded to the Guernseys (United States). (See note below.)

Prize No. III. was won by the Holsteins (Ontario) with a net profit of $262.14.

Prize No. IV. was won by the Holsteins (Ontario) with a net profit of $273.87.

Thus, by winning three of the four prizes contested for, the Ontario breeders demonstrated that by years of careful selection, breeding and feeding they have produced cows of exceptional value as profit makers.

(NOTE.—Prize No. II. was to be awarded to the herd showing the greatest net profit, butter alone considered, *as determined by the churn*. Owing to a lack of proper appliances no churnings were made until three weeks after the test had begun, and in awarding the prize the butter for these three weeks was *estimated*, which gave the prize to the Guernseys. The Canadians, however, claimed that as Prize No. 1 was for estimated butter there should be no estimated butter in Prize No. 2. If the butter estimated for the first three weeks be not added in, the prize for churned butter rightfully belongs to the Ontario Jerseys.)

The following table gives the results of each breed in the four different dairy tests for the six months beginning May 1st, ending October 31st.

Herds.	Cost of feed.	Pounds of milk.	For Prize No. I. Profit in butter fat.			For Prize No. II. Profit in churned butter.			For Prize No. III. Profit in total solids.			For Prize No. IV. Profit in total solids and loss or gain in live weight.		
			Pounds fat.	Value of fat.	Profit.	Pounds butter.	Value of butter.	Profit.	Pounds solids.	Value of solids.	Profit.	Gain in weight.	Value of gain in weight.	Profit.*
Holsteins	$164 27	39,244.5	1,276 10	$375 20	$210 93	1,251.63	$312 90	$148 63	4,739 59	$426 41	$262 14	391	$11 73	$273 87
Jerseys	137 78	26,938.9	1,240.91	363 11	225 33	1,246.37	311 59	173 81	3,771.98	339 40	201 62	189	5 67	207 29
Shorthorns	162 12	31,831.5	1,138.52	334 85	172 73	1,140.65	285 16	123 04	4,083 12	367 32	205 20	802	24 06	229 26
Ayrshires	140 98	32,990.9	1,219.83	358 69	217 71	1,224 37	306 09	165 11	4,195.09	376 00	235 02	218	6 54	241 56
French-Canadians	113 01	24,726 4	984.31	289 58	176 57	1,036.03	259 00	145 99	3,277.72	294 94	181 93	288	8 64	190 57
Guernseys	137 07	27,328.4	1,247 59	366 92	229 85	1,232.70	308 18	171 11	3,774.93	340 07	203 00	195	5 85	208 85
Red Polled	138 07	28,695.3	1,141.97	335 79	197 72	1,140.69	285 17	147 10	3,784.48	340 56	202 49	350	10 50	212 99
Brown Swiss	147 15	30,896.6	1,123.15	330 29	183 14	1,226 50	281 62	134 47	3,943.86	354 86	207 71	198	5 94	213 65
Polled Jerseys	108 30	20,265.1	948 31	278 86	170 56	965.66	241 42	133 12	2,814.62	253 29	144 99	275	8 25	153 24
Dutch Belted	133 06	24,913.8	847.68	249 40	116 34	907.33	226 83	93 77	3,068 46	276 15	143 09	376	11 28	154 37

* The profits for Prize No IV. are got by adding the profit in total solids (Prize No. III.) to the value of the gain in live weight.

REPORT

OF THE

REGISTRAR OF LIVE STOCK

OF THE

PROVINCE OF ONTARIO

1901.

DOMINION SHORTHORN BREEDERS' ASSOCIATION.
CANADIAN AYRSHIRE BREEDERS' ASSOCIATION.
CANADIAN HEREFORD BREEDERS' ASSOCIATION.
HACKNEY HORSE SOCIETY.
CLYDESDALE HORSE BREEDERS' ASSOCIATION.
SHIRE HORSE BREEDERS' ASSOCIATION.
HARNESS, HUNTER AND SADDLE HORSE SOCIETY.
CANADIAN HORSE BREEDERS' ASSOCIATION.

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1902.

WARWICK BRO'S & RUTTER, Printers.
TORONTO.

DOMINION SHORT-HORN BREEDERS' ASSOCIATION.

OFFICERS FOR 1901

President - - - - - - - ROBERT MILLER, Stouffville, Ont.
First Vice-President - - - WILLIAM LINTON, Aurora, Ont.
Second Vice-President - - - W. G. PETTIT, Freeman, Ont.

Ex-Presidents—Life Members:

Hon. JOHN DRYDEN, Brooklin, Ont. — RICHARD GIBSON, Delaware, Ont.
A. JOHNSTON, Greenwood, Ont. — JAMES RUSSELL, Richmond Hill.

Honorary Life Members:

Hon. M. H. COCHRANE, Hillhurst, Que. — JOHN MILLER, Brougham, Ont.
JAS. I. DAVIDSON, Balsam, Ont.

Vice-Presidents from Provinces:

A. W. SMITH, Maple Lodge, Ont. — GEO. A. FAWCETT, Sackville, N.B.
F. G. BOVYER, Georgetown, P.E.I. — J. A. TURNER, Calgary, Alta.
W. H. LADNER, Ladner's Landing, B.C. — C. A. ARCHIBALD, Truro, N.S.
JAS. A. COCHRANE, Hillhurst, Que. — W. A. HUEBACH, Touchwood Hills, Assa.
J. E. SMITH, Brandon, Man.

Board of Directors

B LIST.	A LIST.	C LIST.
W. J. Biggins, Clinton.	Jas. M. Gardhouse, Highfield.	W. D. Cargill, Cargill.
Wm. B. Watt, Salem.	T. E. Robson, M.P.P., Ilderton.	S. Dyment, Barrie.
Jas. Tolton, Walkerton.	Edward Jeffs, Bond Head.	John Isaac, Markham.
W. D. Flatt, Hamilton.	H. Smith, Hay.	Geo. Raikes, Barrie.
John Davidson, Ashburn.	Thos. Russell, Exeter.	C. M. Simmons, Ivan.

Executive and Finance Committee: Robert Miller, Stouffville; W. D. Flatt, Hamilton; H. Smith, Hay; Arthur Johnston, Greenwood; W. G. Pettit, Freeman.

Delegates to Dominion Cattle Breeders' Association: T. E. Robson, M.P.P., Ilderton, Ont.; John Isaac, Markham, Ont.

Delegates to Industrial Exhibition: Hon. John Dryden, Brooklin, Ont.; Robert Miller, Stouffville, Ont.

Delegates to Western Fair: Henry Smith, Hay, Ont; C. M. Simmons, Ivan, Ont.

Delegates to Central Fair, Ottawa: R. R. Sangster, Lancaster, Ont.; D. McLaren, Dunmore, Ont.

Delegates to Provincial Exhibition, Nova Scotia: C. W. Holmes, Amherst, N.S.; F. C. Dickie, Fort William, N.S

Delegates to Provincial Exhibition New Brunswick: Senator Josiah Wood, Sackville, N.B.; Geo. A. Fawcett, Sackville, N.B.

Delegates to Provincial Exhibition, Prince Edward Island: C. C. Gardiner, Charlottetown, P.E.I.; F. G. Bovyer, Georgetown, P.E.I.

Delegates to Winnipeg Industrial Exhibition: Hon. Thos. Greenway, Crystal City, Man.; W. S. Lister, Middle Church, Man.

Delegate to Calgary Exhibition; F. A. Macnaughten, Calgary, Alta.

Delegate to New Westminster Exhibition: W. H. Ladner, Ladner, B.C.

Secretary and Editor: (To whom all communications are to be sent.) Henry Wade, Parliament Buildings, Toronto.

DOMINION SHORTHORN BREEDERS' ASSOCIATION.

DIRECTORS' MEETING.

The sixteenth annual meeting of the Directors of the Dominion Shorthorn Breeders' Association was held in the Albion Hotel, Toronto, February 3rd, 1902.

In the absence of President Miller, Vice-President Linton took the chair, and called upon the Secretary to read the minutes of the last annual meeting, which, on motion, were adopted as having been read.

The Secretary then read the minutes of the Executive meetings and the minutes of a Special Directors' meeting which had been called in October to take into consideration the tuberculin test.

Mr. Johnston said the whole matter of preparing a petition to be submitted to the Dominion Government was left in the hands of the Hon. John Dryden, and they had heard nothing of the petition since.

Mr. W. D. Flatt stated he saw Mr. Dryden, and he thought owing to the unsettled state of things and the stand Secretary Wilson had taken it was not advisable to act in the matter at the present time Mr. Flatt instanced a case of his own in the old country where eight out of ten animals reacted. They had been driven three miles in the hot sun and bothered with flies and they went two degrees above. Dr. Rutherford knew it was not right that they should be tested in that condition, but he got instructions to knock anything out that went two degrees above. Mr. Flatt thought in a case of that kind discretion should be shown on the part of the veterinary. He also stated that Dr. Rutherford was trying to come to some arrangement with the Government whereby the sworn value of any animal slaughtered would be paid to the owner. Dr. Rutherford had already stated that this would be done. Continuing Mr. Flatt said: "An animal in the highest condition is more liable to react, and I do not think we should allow this opportunity to pass without again impressing our opinions upon the Government, and if it is not infallible it is not reliable, and they should adopt some other plans. If Mr. Fisher will not take our interests into consideration I do not think we ought to leave this room without putting ourselves on record as opposed to tuberculin test and the ninety days' quarantine. There is no disease in England that admits of the ninety days' quarantine. I would like to have a resolution put before this meeting covering these grounds, that we are still as much opposed to the test as we ever were." I said to the Hon. Mr. Fisher, "You, led by Prof. McEachern, were the first, as I understand, to instigate this test; you have also been the means at Washington of putting up the bars. I am in favor of doing away with the test, let Washington do what they may."

Mr. Richard Gibson and other members were of the same opinion as Mr. Flatt.

Moved by C. M. Simmons, seconded by Capt. Robson, "That the President, Richard Gibson, Arthur Johnston, and D. C. Flatt be a committee to prepare a resolution regarding the tuberculin test and ninety days' quarantine, to be submitted to the annual meeting." Carried.

The Secretary then read his annual report, and, on motion of Richard Gibson, seconded by Jas. M. Gardhouse, it was unanimously adopted.

The matter of printing the Herd Book in smaller type, leaving out the transfers and having it bound in one volume was then taken up by the Directors, and a resolution was framed to be submitted to the annual meeting.

Mr. Gibson thought the Herd Book should only be a work of reference, and Mr. Flatt was of the opinion the Herd Book could be put in about two-thirds the compass and still have a good reasonable print, not leaving so much bare space as at present.

The Secretary asked if they were in favor of having the transfers printed, and it was the general opinion they should not as long as an office record was kept of them.

Mr. Gibson said his idea would be to trace back to the imported cow, and if they wanted to condense the cow pedigrees that could be done in the type, and then trace them all to the imported cow in the same volume.

Capt. Robson: Supposing you adopt the plan as suggested by the Executive, that is, print volume 18 in full and for the next five volumes or so give only the sire, dam and her sire, and you get imported animals into the volume with entirely different breeding to any others, what would you do in that case?

It was thought by the Secretary in a case like that they would be printed in full.

A series of resolutions were then drawn up to be submitted to the annual meeting for approval, and they appear in the minutes of that meeting.

The meeting then adjourned.

ANNUAL MEETING.

The sixteenth annual meeting of the Dominion Shorthorn Breeders' Association was held in Richmond Hall, Toronto, February 4th, 1902, at 11 a.m., President Robert Miller in the chair.

ADDRESS BY ROBERT MILLER, STOUFFVILLE.

I am very pleased to meet you once more. We are going to lay before you a rather interesting programme and we ask your attention to try and adjudicate on the questions brought before you so that we will retain the character we have had in the past of doing our business in a business-like manner.

I am pleased to congratulate you on the increased membership during the last year. I am also pleased to say to you that our income has been greater than in any year past. We have not quite as much money in the treasury as last year, but we can, I think, show you that the money that has been expended has done good for the Shorthorn breeders and the Shorthorn breed of cattle. I think that is all you will ask of your Executive Committee.

We had a meeting of the Board of Directors last night, and we considered several questions that we shall lay before you and have you consider to-day, and I think we are entitled to some credit for the plan in which we carry out the business of the Shorthorn Breeders' Association of this country, and it should receive your sanction and the sanction of all the other Shorthorn Breeders' Associations throughout the world.

In the United States—I say this not that I wish to cause any reflections on the procedure of the Shorthorn meetings there—they do nothing at the annual meeting but elect their officers. The Board of Directors meet and do all the business. As a matter of fact, we have thought in some instances—I am speaking now as a member of the Shorthorn Association of the United States—that the most important questions should be handled at the annual meeting of the Shorthorn Association, the only proper and sensible way to deal with all important matters.

We are now going to lay before you the matters under consideration last night, and we want you to discuss them thoroughly and all have some say in the legislation which is going to be carried into effect during the next year.

I might also say I congratulate you on the thrifty condition of the Shorthorn business during the past year, and that prospects for the coming year are just as good as those of the past year.

REPORT OF SECRETARY AND EXECUTIVE COMMITTEE.

The Executive Committee beg to present the Sixteenth Annual Report of business done by this Association, as furnished by the Secretary, for the year ending 31st of December, 1901.

Registrations have steadily increased for the last five years, this year still keeping ahead. Volume XVII. has been issued in two parts—one for bulls, containing 4,045, one for cows, containing 5,361, or a total of 9,406; an increase of 2,582 more than in Volume XVI. In Volume XVII. will be found a list of premiums awarded at the following Exhibitions in 1900: for which the Association donated special prizes, viz.: Toronto, London, Ottawa, Winnipeg and Brandon, Man.; St. Johns, N.B.; Halifax, N.S.; Charlottetown, P.E.I.; Sherbrooke, Que.; Calgary, Alta; Saskatoon, Sask.; New Westminster, B.C., and the Provincial Winter Fair, Guelph.

The Ontario members were again, by resolution, made members of the Dominion Cattle Breeders' Association at 50 cents per member, and this amounted to $533.00, which amount was duly apportioned by the Executive Committee for prizes at the Winter Fair for fat cattle, dressed carcasses and dairy cattle. A further sum of $100.00 was given to the Maritime Provinces' Winter Fair, held at Amherst, N.S., as specials, in addition to the ordinary prizes. $1,100.00 was given to the Industrial Exhibition at Toronto, under the conditions that they would give the same amount, which was done. A magnificent Shorthorn show was the result; most of the animals went from there to the Pan-American Exhibition at Buffalo. This Association gave $300.00 for prizes at the Pan-American Exhibition, an addition of one-fourth to their prize list, which amount was nearly all taken up by Canadians. Our Association was also the means of inspiring an exhibit of Dairy Shorthorns at the Pan-American Exposition, and afterwards awarded the sum of $150.00 to the owners of three of the cows who had so kindly allowed them to be donated for this exhibit. $500.00 was voted to London under the same ruling as the amount voted to Toronto, but they only claimed $200.00, as that was all they were willing to put up. Ottawa got $90.00; Sherbrooke, $100.00; Quebec, Que., $100.00; Halifax, N.S., $100.00; Winnipeg, $500.00; Brandon, $163.00; Calgary, Alta, $25.00; New Westminster, B.C., $100.00—a total of $3,571.00, against $2,550.00 last year.

Shorthorns have been in good demand during the last year at public sales, and especially at private ones, more pure bred cattle having left Canada than in any one year heretofore. Most of these have gone across the border to the United States, although a goodly number have gone to the Northwest and British Columbia. The exodus to the west has been very much assisted by the special shipments in what is called the Government car, under the direction of Mr. F. W. Hodson, Dominion Live Stock Commissioner, and Mr. A. P. Westervelt, Secretary of the Dominion Cattle Breeders' Association. The Shorthorn Association has been asked, and has contributed, $100.00 towards the wages of a man to take charge of these cars.

High honors have been taken by Canadians at the Pan-American and other American shows, and high prices have been obtained by them at American sales, large prices have also been paid by Canadians at those sales. It has altogether been the most successful year in Canada for Shorthorns that was ever known.

Mr. De Warren Green of Toronto was deputed by this Association to interview the President and Directors of the Shorthorn Society of Great Britain and Ireland. He had a very satisfactory interview with them and got the promise of some very important concessions, with the proviso that the Canadian and American Associations would change their standard of entries of imported cattle from Volume XX. to Volume XXX. of the English book. A small committee was appointed to confer with the American Association at their annual meeting in Chicago, which they did with the Directors of that Association, explaining the situation to them and urging the passing of a resolution to that effect, our committee believing that it would be a great benefit

to the Shorthorn interests if it was done. The Secretary of the American Association wrote us, since, that on a division of their directors it was lost by one vote. If this had passed the American and Canadian Associations the English Herd Book would have raised the number of crosses required to record in their Book, and the vexatious delay, the uncertainty as to eligibility of pedigrees and, in many cases, the financial loss to importers would have been obviated.

The following gentlemen have imported cattle this year, namely: Messrs. H. Cargill & Son, Cargill, Ont.; Geo. Isaac, Bomanton; Director of Dominion Experimental Farms, Ottawa; H. J. Davis, Woodstock, Ont.; W. C. Edwards & Co., Rockland; W. D. Flatt, Hamilton; Arthur Johnston, Greenwood; Edwin Battye, Gore Bay, Ont.; John Isaac, Markham; Robert Miller, Stouffville; W. J. Isaac, Harwood; R. Mitchell & Son, Nelson, Ont.; Hon. M. H. Cochrane, Hillhurst, Que.

The office work has also increased very largely in every way, over 17,000 letters having been sent out and also 1,565 membership receipts.

Many of the breeders write to know why females are not numbered the same as males, and often return certificates to have them numbered. The explanation is simple. Pedigrees of females are all printed alphabetically under their owners' names, which are also in the Herd Book. If breeders sent in their registrations at different times during the year the numbers of their cows would be all mixed up and would cause great confusion; hence we cannot number them consecutively until the volume is completed.

All pedigrees shall be signed by the breeder, or in case of death, by a proper representative. The breeder of an animal is the owner of the dam at the time of service.

In 1898 the annual fees were reduced to $2.00 per annum, which has resulted in a very large increase in membership, consequently circulating more of the Herd Books amongst the breeders. The penalty fees have also been reduced—to members, from $1.75 to $1.00; and for non-members, from $2.25 to $1.75. The time limit was changed, in 1897, to two years, instead of eighteen months.

A list of errors in previous volumes is made in each volume, and should be marked in red ink in the volume mentioned. We also hope breeders will furnish us with any catalogue of sales that may be made during the year.

Your committee would call particular attention to the rule requiring all calves born to be recorded before they are twenty-four months old. A penalty fee will be charged after that age. Attention is also called to the clause of the constitution which requires that "a member must pay up all his fees in arrears before he can resign; and to another clause, "That when books and documents are mailed, properly prepaid, the duties of the Association are fulfilled, and should a volume or pedigree be lost in the mail, duplicate copies will have to be paid for."

Registrations. In 1901 we were paid for 8,874 registrations and 3,019 changes of ownership and duplicate certificates; against, in 1900, 7,990 registrations and 3,397 changes of ownership; against, in 1899, 7,068 registrations and 2,006 changes of ownership.

Registration Fees. Following up the change in registrations, as a matter of course there is a corresponding change in registration fees. In 1891 we received $3,152.50; in 1892, $3,835.25; in 1893, $3,787.45; in 1894, $3.357.75; in 1895, $3,222.00; in 1896, $2,954.00; in 1897, $4,124.25; in 1898, $5,233.00; in 1899, $6,854.75; in 1900, $7,953.00; and in 1901, $8,560; an increase of $607.75 over 1900.

Herd Books. There were sent out in 1901: Of Vol. I., 7 copies; of Vol. II., 7 copies; of Vol III., 11 copies; of Vol. IV., 22 copies; of Vol. V., 30 copies; of Vol. VI., 34 copies; of Vol. VII., 43 copies; of Vol. VIII., 51 copies; of Vol. IX., 44 copies; of Vol. X., 112 copies; of Vol. XI., 175 copies; of Vol. XII., 110 copies; of Vol. XIII., 122 copies; of Vol. XIV., 186 copies; of Vol. XV., 262 copies; of Vol. XVI., 276 copies; and of Vol. XVII., 134 copies; a total of 1,626 copies, or 281 more than for 1900.

Pedigrees on Record.

Volume	I. contains	3,304	
"	II. "	4,427	
"	III. "	4,593	
"	IV. "	4,957	
"	V. "	4,388	
"	VI. "	5,904	
"	VII. "	4,954	
"	VIII. "	4,024	
"	IX. "	3,633	
"	X. "	3,669	
Volume	XI. contains	3,213	
"	XII. "	3,148	
"	XIII. "	2,714	
"	XIV. "	4,147	
"	XV. "	5,776	
"	XVI. "	7,024	
"	XVII. "	9,406	
"	XVIII. will contain about..	10,000	
		161,251	

As shown by the above table, we are now recording the Nineteenth Volume, which will contain animals recorded in 1902.

Number of Members.

	New Paid.	Resigned and lapsed.	Not Paid.	Old Paid.	Total Paid.
Dom. S. H. B. Asso., 1886.....	109	41	77	315	424
" " " 1897.....	106	36	50	431	537
" " " 1898.....	250	24	48	463	713
" " " 1899.....	399	31	83	657	1,056
" " " 1900.....	305	64	142	946	1,251
" " " 1901.....	310	82	129	1,255	1,565

This table shows that our paid-up membership roll has increased 314 in the last year in total numbers. Our income from members' fees for 1896 was $1,289 ; for 1897, $1,615; for 1898, $1,536 ; for 1899, $2,112; for 1900, $2,502; and for 1901, $3,130.

EXTRACTS FROM BY-LAWS.

Section 1. Persons desirous of becoming members shall so notify the Secretary, pay the entrance fee, and agree, if elected, to conform to the rules of the Association, and not to withdraw without paying all fees due and giving three months' notice of their intention of doing so.

Section 2.—Members shall pay an entrance fee of $2.00, and subsequently an annual subscription of $2.00, which annual subscription shall be due and payable on the first of January of each year.

Section 5. Members must keep the Secretary advised of their postoffice address, and all communications shall be considered as delivered which have been mailed, properly addressed and prepaid.

New By-law. That all calves dropped after January 1st, 1889, shall in future be registered within twenty-four months of birth, and if not so registered, enlarged fees shall be charged for their registration.

Section 15. Fees—Charges for registration will be : To members, registration and certificate, 75 cents for each animal; to non-members, registration and certificate, $1.25 for each animal ; over age, to members (in all cases a certificate goes with registration), $1.00 for each animal; over age, to non-members (in all cases a certificate goes with registration), $1.75 for each animal; change of ownership, 25 cents ; duplicate certificate, 25 cents ; back volumes of Herd Books, $2.00 each.

Henry Wade, Secretary.

Parliament Buildings, Toronto.

FINANCIAL STATEMENT.

Receipts.

Cash on hand	$ 8,220 44
1255 Yearly Subscribers	2,510 00
310 New Subscribers	620 00
Registration Fees for Pedigrees, 8,874; Transfers 3,019	8,560 75
Interest on deposit	302 14
Herd Books (69)	138 00
	$20,351 33

Expenditure.

By Wages Government Car	
National Live Stock, etc	$ 80 00
Insurance	19 79
Printing and Stationery	538 33
Postage	809 88
Auditor and stenographer	97 50
Miscellaneous, Telegraph, Cartage, etc	34 78
Herd Books, binding	431 00
Herd Book, Vol. XVII., printing	3,334 67
Prizes at different shows	3,038 00
Cattle Breeders' Association grant for prizes	533 00
Directors' and Committee expenses	555 15
Commission	3,407 80
Cash	7,471 43
	$20,351 33

ASSETS.

To cash	$7,471 43
Office Furniture, Books, etc	150 00
Vol. I. D.H.B., 98 copies	147 00
" II. " 222 "	333 00
" III. " 225 "	337 50
" IV. " 397 "	445 50
" V. " 230 "	345 00
" VI. " 162 "	243 00
" VII. " 97 "	145 50
" VIII. " 72 "	108 00
" IX. " 10 "	15 00
Vol. X. D.H.B., 9 copies	13 50
" XI. " 234 "	351 00
" XII. " 294 "	441 00
" XIII. " 284 "	426 00
" XIV. " 233 "	349 00
" XV. " 279 "	418 50
" XVI. " 1075 "	2,150 00
" XVII. " 1366 "	2,732 00
	$16,622 43

I hereby certify that I have examined the books and accounts of the Dominion Shorthorn Breeders' Association for the year ending December 31st, 1901, and that the above statement is in accordance with the same.

Toronto, January 18th, 1902. Chas. F. Complin, Auditor.

RESOLUTIONS.

The following resolutions were drawn up at the Directors' Meeting for approval at the Annual Meeting:

That Volume 18 be printed in a more condensed form, making one volume only, with smaller type, and that the transfers be left out. Carried.

That the members of the Shorthorn Breeders' Association, resident in Ontario, be made members of the Cattle Breeders' Association at 50c per member; this amount to include the donation to the Provincial Winter Fair, and the whole sum to be given in prizes at that exhibition; also that two representatives be appointed to act on the Board of the Cattle Breeders' Association, and the adjudication of the prize money be left in the hands of the Executive Committee. Carried.

"That the Shorthorn Breeders' Association grant the sum of $100 towards paying the wages of a man in charge of cars of live stock to the west." Carried.

"That members of the Association should receive, on payment of their first subscription, the volume in which the majority of the dams of the animals which they at that time record, and that on payment of each successive membership fee the volume next in order should be sent, provided that should a member purchase the intervening volumes, he should, upon payment of his next membership, receive volume next in order to the last one he has purchased." Carried.

"That this Association duplicate last year's prizes, with the exception of Calgary, Saskatoon and Assiniboia, that $100 be donated to Calgary only, the other two places to receive no grant; and that the amounts be awarded on the same conditions." Carried.

"That the Dominion Shorthorn Breeders' Association grant the amounts, as given below, from the funds of their Association towards the prize lists of the different exhibitions, on condition that each Fair Board Association grants the same amount for Shorthorn prizes ; or, in the event of any exhibitions not giving the same amount donated by this Association it be the same as the sum granted by said Exhibition Associations, but they must, however, give as much for Shorthorns as for any other breed. Competition to be open to Canada or the United States, and all animals exhibiting must be recorded in the Dominion Shorthorn Herd Book : Toronto, $1,000 ; London, $500; Winnipeg, $500; Brandon, Man., $250; Ottawa, $100; Sherbrooke, Que., $100; Halifax, N.S., $100; St. John, N.B., $100; Charlottetown, P.E.I., $100; New Westminster, B.C., $100; Calgary, Alta, $100."

"That the memorial drawn up, requesting the President of the World's Show at St. Louis, in 1903, to appoint Mr. W. E. Skinner as Live Stock Director, be signed by the President and Secretary, on behalf of over fifteen hundred members of the Dominion Shorthorn Breeders' Association." Carried.

"That the matter of changing our standard of accepting pedigrees recorded up as high as Volume 30, in the English Herd Book, take effect when the American Association adopts the same rule." Carried.

A lengthy discussion arose on the above resolution, and Mr. W. D. Flatt finally summed up the whole matter. He said he thought the idea of this Association was to try and get the three associations somewhat near on the same points. The least petty annoyance you have in a business the more good men you will have go into it, and the more good men will stay in it. It was his opinion that as an association they should do away with all petty annoyances and work in conjunction with the breeders of the United States and the breeders of Great Britain.

"That the President, Richard Gibson, W. D. Flatt and Arthur Johnston be a committee to prepare a resolution regarding the tuberculin test and ninety days' quarantine." Carried.

A resolution was drawn up in reference to these two matters and submitted at the annual meeting, but on the suggestion of Mr. Dryden it was changed somewhat, and on motion of Arthur Johnston, seconded by William Linton, it was resolved : "That in the opinion of this Association no good object is attained under existing circumstances by the continuance of the present ninety days' quarantine, and that the Department of Agriculture be requested to so change the regulations as to give importers such relief as may seem expedient."

It was further resolved : "That a committee consisting of Hon. John Dryden, Robert Miller, Arthur Johnston, W. D. Flatt, Capt. T. E. Robson, M.P.P., and A. W. Smith be appointed by this Association to confer with Dr. Rutherford, who has lately been appointed successor to Dr. McEachern, with the view of presenting, especially, the views of this Association as to the two questions of quarantine and tuberculin test, and such other matters as may be suggested."

ADDRESS BY HON. JOHN DRYDEN, MINISTER OF AGRICULTURE, TORONTO.

I am glad to have the privilege of congratulating you on what I deem to be the favorable outlook for the business in which you are all interested. It must be understood that the breeding of Shorthorns—pedigreed Shorthorns—is what might be called a foundation industry. You, gentlemen, are not breeding and feeding bullocks which are to be exported to Great Britain, but you are breeding and feeding the cattle from whence these must come, and hence, if your cattle are not first-class we cannot expect that that which comes from them will be superior stock either ; but, we have plenty of proof in the history of the past, that the foundation stock we have in this country is of the highest character.

Now, I think our surplus bulls ought to be used as sires in our own Province, but instead of that large numbers of them are being exported. I have no objection to this exportation, but I must say the numbers we have produced ought to be used at least in our own Province. We all know, as a matter of fact, they have not been, at least for some time ; the numbers produced and used here have become less and less ; the result of this we all understand. Dairy sires were used instead of those of their own breed, and they became mixed up among the beef cattle, and when represented for the trade in this and other markets they are the cattle they speak of as being off-color.

I think I see signs of an improvement just now. We all know for the last few years probably more of these animals have been used, but there are forces at work which will directly lead to a larger number being used at least, all over this Province. And why I say that is this : It is not so many years ago since the buyer, when he came to your stables to purchase steers which were supposed to be finished and ready for the market, would probably be able to give you $3.50 per hundred. Now what is the effect of that ? The effect is, those men who were taking care of these animals and feeding them up did not get sufficient remuneration for their trouble, and the result is the first opportunity they get they turn to something that will pay better, and our production of beef cattle is being reduced year by year, and after a while we will get up to $4 per cwt., dressed. And I have always insisted on the man dealing in this trade, it is not enough to pay the farmer to produce the quality of animals we would like to see produced in this country. Now, it has become known that these men may get five cents per pound, and a little circumstance occurred the other day which induces me to say that is not the end, and that to-day there is being paid in this country for choice cattle for export a considerable amount more than I suggest. I sold a Shorthorn cow of good quality for beef the other day, that had produced one calf, for $4.25. She came in a carload lot to Toronto, and I had a little conversation with the man who bought that carlot, and he told me he paid $5.25 for that lot, and mine was—he remembered her distinctly—one of the best in the lot, indicating that she was worth even more than that amount. Now, you can see that we do get our share of the proceeds that should come to us. She weighed about 1,700, and $17 was rather more than the gentleman who purchased the cow was entitled to for shipping and handling her between my place and Toronto.

But what I want to say is, that $5.25 is not the end, and that there are buyers paying more than $5.25. Our farmers do not quite realize it, but the time is not far distant until you will find $6.00 being paid in the markets of Toronto, and why should it not be so, Mr. President, when far more than this is being paid in the City of Chicago, 500 miles farther west than in the Province of Ontario ? I have here before me quotations of the Chicago market, taken from The Breeders' Gazette, one of the best authorities. Now in these quotations—the last week's quotations—the choice steers, what they call very extra prime steers, are quoted at $7.25 to $7.75. But it does not appear, according to the record here, that there were in the market cattle that were good enough to command this higher price, but there were cattle good enough to command $7.40. We can leave this class aside because we may not have many cattle reaching that high class, but we can easily produce them if somebody will buy them and pay the money. Then, coming to the next class, "export and shipping steers," weighing 1,350 to 1,600 pounds, $6.25 to "$7.30." We may leave that to one side also. Then we

come to "export and shipping steers lacking quality." We can surely produce many as good as that, $5.90 to $6.40, then good dressed beef and shipping steers, 1,150 to 1,400 pounds, $6.15 to $7.15. Fair to medium steers, weighing 1,150 to 1,300 pounds, standing about fifth-class in Chicago, are selling there at $5.10 to $5.75, or more than is being paid for our best cattle here on the Toronto market.

Now, I want to know why there should be the difference between the markets here and in Chicago? These export steers are going to the same market, they are travelling over the same railway, riding over the ocean in the same ship; why, then, should there be such a difference in the price? Is it because they were of much better quality? I answer, No. Emphatically, no! That is not the reason, and in saying this I speak of what I know. I have had conversation with a gentleman buying cattle here and buying cattle in Chicago. This gentleman told me he sent animals across from Toronto which exceeded in price in Liverpool the cattle they were sending across from Chicago, and he tells me that he recently secured in the vicinity of Elora and Fergus, in the County of Wellington, some cattle which will bring a better price on their arrival in England than anything sent from the city of Chicago. If that is so, then, when our people come to understand it, we can produce thousands more than we are producing here now; and I often said, if I could stand up somewhere with authority and send out this message, that we have men here who will guarantee six cents per pound for a prime article, I would get you business people in the community who will enter on this trade and make money at it, and there is nothing that will give such an impetus to agriculture in general than that our price for beef be raised, just as I have suggested.

Now, what have been the hindrances in the past? Why is it in the past these prices have been kept so much lower than in Chicago? I will give you several. First of all, there is what I call a scattered market in this country, not sufficient centralization. There are higher insurance rates, which always must be paid by men shipping few animals instead of many. There are higher freight rates on the railways and steamships, and then there is, worst of all, a lack of proper competition in this trade, and a number of men engaged in buying cattle in this country have, apparently, no desire that we should secure the highest place in the matter of beef cattle, and are therefore content to carry on their dealings with cattle not worth more than four or five cents a pound.

Now, I submit that all this can be overcome. We have in our favor the fact that we are five hundred miles nearer the English market, and there should be better rates secured here. If we produce enough cattle of the proper quality we shall get this better rate. The men who ship the cattle will then be able to go to the railways and steamship companies and demand more favorable transportation than they have now, and it seems to me the difficulty could easily be remedied. And, then, let me say that with increased production there will come greater competition, which will bring improved shipping facilities and better rates. It seems to me the people who live in the city of Toronto do not understand the situation, that better stock yards are required, as clearly as we do who live outside.

Now they have in this city a sort of den, a sort of low-down place, and they call it by the great name of "stock yards." Now, in that place there is not room for expansion. There is certainly no room for carrying on the trade as we would like to see it, and I have been wondering all these years that the city of Toronto could not see this. Why, they suppose that now they have reached the limit of the extent of trade for a number of years. No, they have not. If you begin to pay these prices our trade would soon double and treble; but it seems to me, as I watch the discussion of the City Council along this line, they are looking at it from a selfish standpoint, and not from the standpoint of public spirited men and for the interests of the country in general. Now, it is in the country's interest and the cattle breeders', and in both, to have a better concentration of markets than in this country, and therefore a greater expansion of the trade, and we should have better stock yards here—(I have singled out this as perhaps being the best place, for I want to have it located in the best place, wherever

that may be)—in order that trade will be benefited by concentration, and it will lead to almost unlimited expansion.

There is perhaps a fight on now between the present Stock Yards and the New Stock Yards, which are being prepared out at Toronto Junction, because they are outside of the city limits. Well now, as I see it, all the trade done at Toronto Junction would come right into the city, and in that way help to increase trade and give the people better prices in Toronto in every way.

At all events it seems to me, so far as our moral support is concerned, we ought to have it understood that we are supporters of the object which will lead to the expansion of the cattle trade, which I have suggested. Well, what advantage would it be to the Shorthorn breeders? I contend that that is, after all, the foundation of our business, and your business would die out unless somebody was prepared to buy the produce; that is what we are breeding them for. Some people think there is a boom just now in connection with Shorthorns; there is no boom, it is a result of natural conditions, and just so soon as six and six and one-half cents per pound is paid for prime beef in this city, then you will see a greater boom in the Province of Ontario, but animals need to be produced of first-class quality.

Now, Mr. President, I am not willing that the men who continue producing inferior stuff should receive help, but to the people who are anxious to do their best in this trade I am anxious that they should receive all the help possible.

Better facilities will mean a better demand for beef and a better demand for that will mean better prices for this particular quality of our export animals, and a better quality will mean, of course, a better demand and a better price for the sires you have to sell, and which you are breeding to sell. So I want to say this word that it might go to the country generally; that there is a better outlook, there is a better prospect, because when men say I can buy as good cattle here as I can buy in Chicago, and when they are able to get the same transportation facilities from here, they will pay just as much here as in Chicago; and it is the first time in ten years there has been such a bright outlook, and it is the first time I have felt overjoyed in the fact that the trade in cattle is likely to improve, and is likely to go on increasing probably faster than some of you think.

And another thing I say to our ordinary farmers all over the country, you ought to prepare to meet this demand that is coming by buying to-day better breeding stock, by taking better care of what that stock will produce, because the price which the situation guarantees will give a handsome return on your outlay. (Applause.)

President Miller: I am sure you all appreciate the remarks which have fallen from our Minister of Agriculture. I could not give you any better advice than ask you to follow carefully the advice he has given you. I am sure there is a brighter future for all those who will supply themselves with better cattle and take good care of them. There is a scarcity of good cattle throughout this country, and there is a scarcity throughout the United States. I am asked the question very, very often, as to the prospects of the good prices keeping up as they are at present. My answer is, always, that so long as the times are good we will get good prices for good cattle, and when times are not quite so good animals will be the last thing that people will cease to buy. There is a fascination about buying good animals that there is about nothing else.

Major John A. McGillivray: Why can we not get those Chicago prices the Minister has spoken of? The reason no doubt is our markets are too much scattered, and we have no central market, and I would like to ask the Minister if we had a market well established in Toronto, and, say, well established in Winnipeg, would we then attract the Chicago buyers, who give these big prices? I gather from what he said that would be the effect. I can understand the insurance men charging higher rates on smaller lots, and also the ocean men, but if I understood the Minister aright I do not think it would be hard to get concentration of markets. Mr. Dryden stated if we only had concentration of market better prices would be paid. So long as men get animals a hundred miles from here they do not come to this market, but go to Chicago, owing to better prices being paid, and he thought they could easily understand why men engaged in this business did not feel like launching out into it extensively, as, under present

conditions, they could not get the greatly reduced railway and steamship rates, as they could not go to them and make a contract to ship a certain large number every year; then, again, the insurance was much higher via Montreal, over the St. Lawrence, than by Boston or New York, which was another handicap. And the chief reason we did not get the buyers here was because our cattle had not been commanding as high a price in Liverpool because Americans and Englishmen got an idea we could not produce them good enough, but Mr. Gould stated he was getting a higher price for cattle he shipped from here recently than they are getting for the cattle sent from Chicago, and it would not be long before Canadian cattle would be equal to the others.

Hon. Mr. Dryden said the reason he spoke of concentration was because there would be a larger volume of business done, a greater number of men engaged in it, and they could make better arrangements every way, and that would lead to better prices.

Major McGillivray: I think that if it could be shown to the City Council it would be in the interests of the citizens of Toronto to have a well established market, whether inside the limits or outside, the City Council would listen to a representation from the Shorthorn Breeders' Association on that matter.

Mr. C. M. Simmons said he thought six cents per pound was a pretty large figure to get, and he thought five cents per pound was about as much as could be paid by Canadians. He stated our cattle could not compare with the American cattle on the English market as the American cattle were not tied up, but allowed to run about and get exercise, which made their flesh firmer, and the consequence was they landed in England in much better condition than ours. He had been talking to Mr. Gould, and he said if our cattle were handled properly they would get as large a price as any that left the Chicago markets. He had just come from the market, and Mr. Gould had a lot of fine cattle there, and also a number not finished, and hence the breeders could not expect to get the price they pay for the right class in Chicago. Mr. Simmons thought the Dunns of Toronto were as fine judges of cattle as could be found, and they gave all the money they were possibly able to give, and a great portion of the cattle dealers had not made any money. The very shipments Mr. Gould had made were bringing him very little money, and he did not see how much more could be paid for them than at present. He also stated that a large majority of the high-class cattle shipped out of Chicago had lost money. And, as far as the rates were concerned, he thought they would not be able to obtain any greater concessions, no matter what number they guaranteed.

Hon. Mr. Dryden stated what Mr. Simmons had said had not changed his mind at all. He had been studying this matter for the last ten years, and over in Chicago they always paid a dollar beyond what was paid here, and he had been trying to find out the reason; but he wanted the farmers of this country to receive the greatest amount for their produce they could receive. He did not wish to say anything against the dealers here; but they were handicapped in many ways. The very fact that they paid 3 per cent. insurance, and the Americans possibly one, and the very fact that the American rates are so much lower than ours, means that it all comes out of the farmer. Mr. Gould had not told him he was making little money out of his business, and it was not for him to say whether he was or not. Mr. Dryden said he was not asking that the $7.40 rate be paid, but was asking for the fifth class rate in Chicago. He thought the suggestion of Mr. McGillivray was a good one, that a deputation should wait upon the City Council to try and convince them of what their duty was in reference to the market. It did not make any difference to the City of Toronto whether this business was carried outside or inside, and he thought they might dispose of the stock yards now in the city and receive a better revenue than they were at present getting.

Arthur Johnston: We will have to have a market, and the cattle will all have to be sold by commission, as in Chicago, before we can have the slightest chance of getting the value of the cattle. It is a market we want.

C. M. Simmons: I know a great many cattle are being bought now at six cents for future delivery. In the carlots of cattle I saw to-day there were a few there worth six cents, and Mr. Gould bought them for six cents to-day, but say you want to get three or

four hundred together, you would not be able to do it, as we have not thousands of head in this Province, the same as they have in the States.

Richard Gibson: The reason they pay so much more in Chicago is because they utilize everything. Now, we have no chance with the present stock yards of making any use of the loss. The great packers in Chicago can afford to pay a great deal more per pound because there is absolutely no waste. Mr. Armour stated that if he got 50 cents per head profit for a steer that was all he looked for; his profit was made out of the waste. Now, if the cattlemen wish to get the very greatest amount they can they must be in connection with some stock yards where everything can be utilized, and then there will be profit.

Hon. John Dryden: I did not mention that what Mr. Gibson stated was part of this scheme. I understand that Messrs. Swift of Chicago will sell a beef for even less than they paid for it. Now, the only way to make money is by utilizing that which entirely goes to waste in this country. When these outside stock yards are built and equipped I expect they will have abattoirs, every animal will be slaughtered on the spot, and then the hair and hoofs and horns, and so on, will all be utilized, and the farmer will get the benefit.

Moved by A. W. Smith, seconded by W. G. Pettit, "That Hon. John Dryden, Robert Miller, John A. McGillivray, W. D. Flatt, and Arthur Johnston, be a committee to wait upon the City Council with regard to improved market facilities." Carried.

Mr. Graham, of Manitoba, thought this Association was not giving fair play to the western members, as they made all the Ontario members members of the Dominion Cattle Breeders' Association.

Mr. A. W. Smith explained that a great preponderance of the members of the Association were from Ontario, and should expect to have a larger proportion of prize money, and, as far as making the Ontario men members of the Cattle Breeders' Association was concerned, this money which was paid in was all given in prizes at the Winter Fair.

PRIZE WINNING SHORTHORNS AT THE TORONTO INDUSTRIAL EXHIBITION, 1901.

Bull, 4 years old and upwards.

1st. Valiant=25337=roan, calved Nov. 10, 1896. Bred by H. & W. Smith, Hay, Ont.; sire, Abbotsford=19446=; dam, Vanity=24541=; exhibitor, W. D. Flatt, Hamilton, Ont.

2nd. Gwen Allen=38892=red and white; calved Oct. 16, 1896. Bred by E. B. Mitchell & Sons, Danvers, Ill.; sire, Baron Cruickshank 3rd=37847=; dam, Gwendoline 2nd=Vol. 18=Exhibitors, W. C. Edwards & Co., Rockland, Ont.

3rd. George Bruce=25507=roan, calved Dec. 9, 1896. Bred by W. R. Elliott, Hespeler, Ont.; sire, Robert the Bruce=22635=; dam, Rose Bloom=26774.= Exhibitor, Hon. Thos. Greenaway, Crystal City, Man.

Bull, 3 years old and under 4.

1st. Deputy Marshal=38980=red and white, calved March 16, 1898. Bred by Aaron Barter, Avon, N.Y.; sire, Sharon Marshall=38979=; dam, English Lady 13=Vol. 18=. Exhibitor, W. A. Bowland, Grass Lake, Mich.

2nd. Speculator (imp.)=36119=(75714) white, calved July 22, 1898. Bred by W. J. Hosken, Loggan's Mill, Hayle, Cornwall, Eng.; sire, Treforrest (63452); dam, Lady Blithfield 8th. Exhibitor, W. D. Flatt, Hamilton, Ont.

3rd. Captain Mayfly (imp.)=28858=red, calved Feb. 20, 1898. Bred by Donald Fisher, Pitlochry, Perthshire, Scotland; sire, Captain of the Guard (58596); dam, Mayfly. Exhibitor, J. A. Crerar, Shakespeare, Ont.

Bull, 2 years old and under 3.

1st. Lord Banff (imp.)=36053=(77031) roan, calved Jan. 10, 1899. Bred by Alex. Watson, North Auchronie, Aberdeenshire, Scot.; sire, Cap-a-pie (58591); dam, Roan Bessie. Exhibitor, W. D. Flatt, Hamilton, Ont.

2nd. First Choice=30932=white, calved Sept. 15, 1898. Bred by J. & W. B. Watt, Salem, Ont.; sire, Judge=23419=; dam, Lady Aberdeen=33935=. Exhibitor, J. & A. Somerville, Elder's Mills, Ont.

3rd. Sittyton, Hero 7th=30892=roan, calved Sept. 8, 1898. Bred by Jas. I. Davidson & Son, Balsam Ont.; sire, Sittyton Hero=23313=; dam, 39th Duchess of Gloster=23367=. Exhibitor, Hon. Thos Greenaway, Crystal City, Man

BULL CALVED BEFORE FEB. 1, 1900, AND UNDER 2 YEARS.

1st. Royal Wonder=34682=red, calved Sept. 24, 1899. Bred by exhibitors ; sire, Royal Sailor (imp.) =18959=; dam, English Lady 11th=31062=. Exhibitors, J. & W. B. Watt, Salem, Ont.

2nd. Knight Errant=34309=roan, calved Sept. 22, 1899. Bred by W. C. Edwards & Co., Rockland, Ont.; sire, British Knight=25206=; dam, Mary Leslie=28223=. Exhibitor, W. D. Flatt, Hamilton, Ont.

3rd. Marquis Heir=34311=roan, calved Sept. 14, 1899. Bred by exhibitors ; sire, Marquis of Zenda (imp.)=26064=; dam, Canadian Rosebud=29677=. Exhibitors, W. C. Edwards & Co., Rockland, Ont.

4th. Ribbon's Choice (twin)=34694=red and white, calved Oct. 11, 1899. Bred by T. E. Robson, Ilderton, Ont.; sire, Blue Ribbon (imp.)=17095=(63706) ; dam, Rosehill=21161=. Exhibitor, Hon. Thos. Greenaway, Crystal City, Man.

BULL, CALVED ON OR AFTER FEB. 1, 1900.

1st. Hillcrest Hero=38777=red and little white, calved Feb. 11, 1900. Bred by exhibitors ; sire, Charles Dickens=23418=; dam, Antoinette=30938=. Exhibitors, D. Talbot & Son, Everton, Ont.

BULL, CALVED BEFORE FEB. 1ST, 1901, AND UNDER 1 YEAR.

1st. Moneyfuffel Banner=38736=red and little white, calved Sept. 10, 1900. Bred by exhibitor ; sire, Royal Banner=27652=; dam, Mayflower 7th=30157=. Exhibitor, Jas. Leask, Greenbank, Ont.

2nd. Gay Sheron=38994=red, calved Jan. 1st, 1901. Bred by exhibitor ; sire, Sharon Marshal =38979=; dam, Don Superba=Vol. 18=. Exhibitor, W. A. Boland, Grass Lake, Mich.

3rd. King Tom=38782=roan, calved Oct. 5, 1900. Bred by exhibitors ; sire, Hillsburg Tom=26956=; dam, English Lady 12th=31063=. Exhibitors, J. & W. B. Watt, Salem, Ont.

4th. Britannia's Duke=36232=roan, calved Sept. 22, 1900. Bred by Jas. Douglas, Caledonia, Ont.; sire, Christopher (imp.)=28859=; dam, Britannia, 44th=31853=. Exhibitor, W. D. Flatt, Hamilton, Ont.

5th. Shining Light=38920=red, calved Oct. 2, 1900. Bred by exhibitors; sire, Grand Gloster=23774=; dam, Pansy Ray=29822=. Exhibitors, Goodfellow Bros., Macville, Ont.

BULL, CALVED ON OR AFTER FEBRUARY 1, 1901.

1st. Red Archer (imp. in dam)=vol. 18=red, calved Feb. 18, 1901. Bred by T. F. Jamieson, Ellon, Aberdeenshire, Scot.; sire, Mountain Archer (71046) ; dam, Crocus 4th (imp.)=38001=. Exhibitors, W, C. Edwards & Co., Rockland, Ont.

2nd. Mysies' Prince=38885=red with star, calved Feb. 10, 1901. Bred by exhibitor ; sire, Spicy Robin=28259=; dam, Mysie of Green Grove=26805=. Exhibitor, G. D. Fletcher, Binkham, Ont.

3rd. Duke of Roseberry=38842=roan, calved Feb. 20, 1901. Bred by exhibitors ; sire, Prince Arthur =13377=; dam, Simcoe Maid=15069=. Exhibitors, E. Jeffs & Son, Bond Head, Ont.

4th. Marquis Again=38375=roan, calved Feb. 15, 1901. Bred by exhibitors ; sire, Marquis of Zenda =26064=; dam, White Feather 3rd (imp)=34207=. Exhibitors, W, C. Edwards & Co., Rockland, Ont.

BULL, SENIOR CHAMPION, OVER 2 YEARS.

1st. Valiant=25337=. Exhibitor, W. D. Flatt, Hamilton, Ont.

BULL. JUNIOR CHAMPION, UNDER 2 YEARS.

1st. Royal Wonder=34682=. Exhibitors, J. & W. B. Watt, Salem, Ont.

COW, 4 YEARS OLD AND OVER.

1st. Empress 12th (imp.)=38045=red, calved May 19, 1896. Bred by Jos. Harris, Calthwaite Hall, Carlisle, Eng.; sire, Oxford Duke of Calthwaite 30th (69211) ; dam, Empress 10th. Exhibitor, W. D. Flatt, Hamilton, Ont.

2nd. Lady Sharon 4th=Vol. 18=red, calved Oct. 10, 1896. Bred by Aaron Barber, Avon, N.Y., sire, Young Marshall=38978=; dam, Lady Sharon=Vol. 18=. Exhibitor, W. A. Boland. Grass Lake, Mich.

3rd. Jenny Lind 4th (imp.)=31182=roan, calved Jan. 8, 1896. Bred by Sir A. Grant, Moneymusk, Aberdeenshire, Scot. ; sire, Marr (67440) ; dam, Jenny Lind, 2nd (Vol. 40 E. H. B.) Exhibitor, Hon. Thos. Greenway, Crystal City, Man.

COW, 3 YEARS OLD AND UNDER 4.

1st. Cicely (imp.)=38034=roan, calved Feb. 21, 1898. Bred by Her late Majesty the Queen, Windsor, Eng. ; sire, Prince Victor (73320) ; dam, Christobel. Exhibitor, W. D. Flatt, Hamilton, Ont.

2nd. May Blossom (imp.)=38077=white, calved Jan. 13, 1898. Bred by Her late Majesty the Queen, Windsor, Eng. ; sire, Monarch (71025) ; dam, Maid of Honor. Exhibitor, W. D. Flatt, Hamilton, Ont.

3rd. Gem of Ballechin (imp.)=31174=red and white, calved Jan, 1st, 1898. Bred by A. Robertson, Haugh-of-Ballechin, Ballerlinq, Scot. ; sire, Mutineer (69169) ; dam, Gem of Verona 3rd. Exhibitor, J.A. Crerar, Shakespeare, Ont.

HEIFER, 2 YEARS OLD AND UNDER 3.

1st. Lady Sharon 6th=Vol. 18=red, calved Nov. 25, 1898. Bred by A. Barber. Avon, N.Y. ; sire, Scottish Chief=39001= ; dam, Lady Sharon=Vol. 18=. Exhibitor. W. A. Boland, Grass Lake, Mich.

2nd. Lady Waterloo, B. 2nd (imp.)=38067=roan, calved Jan. 28, 1899. Bred by W. Murray, Bellfield, Inverness, Scot. ; sire, Merry Merton (73068) ; dam, Lady Waterloo B. Exhibitor, W. D. Flatt, Hamilton, Ont.

3rd. Village Princess=37316=roan, calved Dec. 23, 1898. Bred by H. Smith, Hay, Ont.; sire, Abbotsford=19446=; dam, Village Queen=37317=. Exhibitor, Hon. Thos. Greenway, Crystal City, Man.

4th. Ascot Mayflower (imp)=38029=roan, calved Jan 1, 1899. Bred by Leopold de Rothschild, Leighton Buzzard, Eng,; sire, Duke of Stratton (74420); dam, Mayflower 4th. Exhibitor, W. D. Flatt, Hamilton, Ont.

HEIFER, CALVED BEFORE FEB. 1, 1900, AND UNDER 2 YEARS.

1st. Lady Hamilton=39639=roan, calved, Oct. 3, 1899. Bred by W. C. Edwards & Co., Rockland, Ont.; sire, Marquis of Zenda (imp.)=26064=; dam, Madge Hamilton=23485=. Exhibitor, W. D. Flatt, Hamilton, Ont.

2nd. Snowball=Vol. 18=white, calved Jan. 1st, 1900. Bred by J. D. Douglass & Son, Hope, Ind. sire, Blue Jeans=39105=; dam, Snowflake=Vol. 18=. Exhibitor, W. A. Boland, Grass Lake, Mich.

3rd. Gem of Ballechin 2nd=39276=red and white, calved Sept. 3, 1899 Bred by exhibitor; sire, Diamond Jubilee (imp.)=28861=; dam, Gem of Ballechin (imp)=31174=. Exhibitor, J. A. Crerar, Shakespeare, Ont.

4th. Golden Pansy=39821=red, calved Sept 10, 1899. Bred by exhibitors; sire, Golden Flame=27770=; dam, Pansy Ray=29822=. Exhibitors, Goodfellow Bros, Maxville, Ont.

5th. Bright Light (imp)=38187=roan, calved Dec. 23, 1899. Bred by Duke of Buccleuch, Kilblean, Old Meldrum, Scot.; sire, Daylight (74350); Bright Bella. Exhibitor, Hon. Thos. Greenway, Crystal City, Man.

HEIFER, CALVED ON OR AFTER FEB 1, 1900.

1st. Rosabel 4th=Vol. 18=red and white, calved May 10, 1900. Bred by exhibitor; sire, Captain Mayfly (imp.)=28858=; dam, Rosabel 2nd=26627=. Exhibitor, J. A. Crerar, Shakespeare, Ont.

2nd. Pine Grove Countess (imp. in dam)=38015=red, calved Aug. 30, 1900. Bred by T. F. Jamieson, Ellon, Aberdeenshire, Scot.; sire, Mountain Archer (71046); dam, Countess 6th (imp.)=37999=. Exhibitors, W. C. Edwards & Co., Rockland, Ont.

3rd. Scottish Rose (imp.)=38023=red, calved Feb. 13, 1899. Bred by W. & T. Bain, Legars, Kelso, Scot.; sire, Earl Marshal (70343); dam, Favorite Rose. Exhibitors, W. C. Edwards & Co., Rockland, Ont.

4th. Fairy Belle=Vol. 18=red, calved March 7, 1900. Bred by exhibitors; sire, Prince Arthur 23377=; dam, Simcoe Maid=15069=. Exhibitors, E. Jeffs & Son, Bond Head.

HEIFER CALF, CALVED BEFORE FEB. 1, 1901.

1st. Lady Sharon, 8th=Vol. 18=red, calved Dec. 1, 1900. Bred by exhibitor; sire, Kintore Hero 26959=(70723); dam, Lady Sharon 3rd=Vol. 18=. Exhibitor, W. A. Boland, Grass Lake, Mich.

2nd. Matchless 28th=Vol. 18=roan, calved Sept. 23, 1900. Bred by exhibitors; sire, Royal Victor 44681=; dam, Matchless of Elmhurst 9th=17269=. Exhibitors, J. & W. B. Watt, Salem, Ont,

3rd. Fame s Matchless=39636=red and little white, calved Sept. 9, 1900. Bred by exhibitor; sire, Golden Fame (imp)=26056=(72610); dam, Sowerby's Matchless=35360=. Exhibitor, W. D. Flatt, Hamilton, Ont.

4th. Clover Hill Lorne=Vol. 18=red, little white, calved Oct. 10, 1900. Bred by A. Montague, Thamesford, Ont.; sire, Red Stanley=25345=; dam, Missie Lorne=30303=. Exhibitor, W. D. Flatt, Hamilton, Ont.

5th. Lavender of Prairie Home=Vol. 18=red, calved Sept. 9th, 1900. Bred by exhibitor; sire, Jubilee (imp.)=28856=; dam, Lavender Lass=39904=. Exhibitor, Hon. Thos. Greenway, Crystal City, Man,

HEIFER CALF, CALVED ON OR AFTER FEB. 1, 1901.

1st. Judge's Heiress=Vol. 18= calved Feb. 2, 1901. Bred by exhibitor; sire, Judge=23419=; dam, Marina (imp)=34234=. Exhibitor, Hon. Thos. Greenway, Crystal City, Man.

2nd. Lily of Pine Grove 2nd=Vol. 18=dark roan, calved Feb. 12, 1901. Bred by exhibitors; sire, Marquis of Zenda (imp)=26064=; dam, Lily (imp.)=34198=. Exhibitors, W. C. Edwards & Co., Rockland, Ont.

3rd. Roan Missie=Vol. 18=roan, calved Feb. 20, 1901. Bred by exhibitor; sire, Spicy Robin=28259=; dam, Mellerstain 4th=39644=. Exhibitor, G. D. Fletcher, Binkham, Ont.

4th. Zora 41st=Vol. 18=roan, calved Feb. 22, 1901. Bred by exhibitors; sire, Prince Arthur=23377=; dam, Zee=35919=. Exhibitors, E. Jeffs & Son, Bond Head, Ont.

SENIOR CHAMPION FEMALE, OVER 2 YEARS.

1st. Cicely (imp.)=38084=. Exhibitor, W. D. Flatt, Hamilton, Ont.

JUNIOR CHAMPION FEMALE, UNDER 2 YEARS.

1st. Lady Hamilton=39639=. Exhibitor, W. D. Flatt, Hamilton, Ont.

FOUR CALVES, BRED AND OWNED BY EXHIBITOR.

1st. Exhibitors, J. and W. B. Watt, Salem, Ont.
2nd. " W. C. Edwards & Co., Rockland, Ont.
3rd. " Goodfellow Bros., Macville, Ont.
4th. " E. Jeffs & Son, Bond Head, Ont.

BEST THREE ANIMALS, GET OF ONE BULL, OWNED BY EXHIBITOR.

1st. Exhibitor, W. A. Boland, Grass Lake, Mich.
2nd. " Hon. Thos. Greenway, Crystal City, Man.
3rd. " W. C. Edwards & Co., Rockland, Ont.

BULL AND 4 FEMALES, UNDER 2 YEARS, OWNED BY EXHIBITOR.

1st. Exhibitor, W. D. Flatt, Hamilton, Ont.
2nd. " W. C. Edwards & Co., Rockland, Ont.
3rd. " Hon. Thos. Greenway, Crystal City, Man.

HERD OF ONE BULL AND 4 FEMALES, OVER 1 YEAR, OWNED BY EXHIBITOR.

1st. Exhibitor, W. D. Flatt, Hamilton, Ont.
2nd. " W. A. Boland, Grass Lake, Mich.
3rd. " W. D. Flatt, Hamilton, Ont.

CANADIAN AYRSHIRE BREEDERS' ASSOCIATION.

DIRECTORS' MEETING.

The Directors of this Association convened at Richmond Hall, Toronto, February 5th, 1902, at 11 a.m., President W. F. Stephen, Trout River, Que., in the chair.

The minutes of the last meeting were taken as read.

The Secretary read a letter from Mr. E. B. Elderkin, Canadian Superintendent of Live Stock at the Pan-American Exposition, calling attention to the fact that the Ayrshire breed in Canada had been represented for six months in the Model Dairy there by five cows, one from Mr. R. Ness, jun., Howick, Que., and two from Messrs. Ogilvie & Co., and Robert Reford of Montreal. These cows had done grand work when the conditions with which they were surrounded were taken into consideration, and he felt it was not fair to ask these gentlemen to make so great a sacrifice without in some way evidencing the appreciation of their efforts He suggested that the Ayrshire Association take the matter into consideration and treat the exhibitors mentioned in a generous manner. He was sending a like appeal to all Canadian Associations represented, and the Shorthorn Association had already contributed $50 per cow.

Mr. Boden, manager for Robert Reford, thought if each of the gentlemen mentioned in Mr. Elderkin's letter received a medal they would appreciate that as much as anything, and a resolution to that effect was passed, and is embodied in the minutes of the annual meeting.

A letter was also read from Mr. Robert Ness, suggesting the names of W. F. Stephen and George Buchanan as judges.

A series of resolutions were drawn up, and appear in the minutes of the annual meeting.

OFFICERS FOR 1902.

President : F. W. Hodson.....Ottawa, Ont.
1st Vice-President : Senator Owens .....Montreal, Que.

Vice-Presidents.

Ontario : N. Dyment, Clappison's Corners.
Quebec : Robert Ness, Howick, Que.
Manitoba : Geo. Steele, Glenboro, Man.
Assiniboia : C. W. Peterson, Regina, Assa
British Columbia : A. C. Wells, Chilliwack.
Prince Edward Island ; Hon. T. Rogers, Charlottetown, P E.I.
Nova Scotia : Fred Black, Amherst, N.S.
New Brunswick : M. H. Parlee, Sussex, N. B.

Directors.

Ontario.

J. G. Clark ....Ottawa.
Wm. Stewart, Jr. ..Menie,
A. Kains .....Byron,
W. W. Ballantyne..Stratford,
A. Hume .....Menie.
J. C.Smith.....Hintonburg.
F. W. Hodson.....Ottawa.

Quebec.

Jas. Boden .....Ste. Anne de Bellevue
Wm. Wylie..... ..Howick.
Senator Owens .....Montreal.
R. Hunter.....Maxville.
R. R. Ness, Jr.....Howick.
Nap. Lachapelle ...St. Paul l'Hermite.
W. F. Stephen .....Trout River.

Executive Committee (Eastern Division) : R. Hunter, Senator Owens, Nap. Lachapelle.
Executive Committee (Western Division) : Wm. Stewart, jr.. W. W. Ballantyne, J.C.Smith.
Revising Committee : F.W. Hodson, Senator Owens, J.C. Smith, Robert Ness, and H.Wade.
Auditor (Ontario) : C. F. Complin, London.
Auditor (Quebec) : Senator Owens, Montreal.
Eastern Secretary : J. P. L. Berube, Montreal.
Secretary-Treasurer : Henry Wade, Toronto.
Delegates to Industrial Exhibition : W. W. Ballantyne, and William Stewart, jr.
Delegates to Western Fair : A. Kains and D. Hill, Delaware.
Delegates to Ottawa : F. W. Hodson and Jos. Yuill.
Delegates to Sherbrooke, Que. : T. D. McCallum and Robert Ness.
Delegates to Quebec : Nap. Lachapelle and A. Drummond.
Delegates to Dom. Cattle Breeders' Association : W. W. Ballantyne and H. Wade.

Judges Recommended.

W. W. Ballantyne moved, seconded by J. G. Clark, "That this Association ask the different Fair Associations to appoint only one judge."

Alex. Hume moved in amendment, seconded by R. Hunter, "That three judges be appointed to act for the Industrial only, to act alternately." The amendment carried in respect to Toronto.

Toronto Industrial : J. H. Grisdale, Ottawa ; A. Kains, Byron ; W. W. Ballantyne, Stratford ; J. H. Douglas, Warkworth (reserve).

Ottawa Central : A. Kains, Byron.

London Western : Thos. Bradshaw, Ottawa, and Geo. McCormack, Rockton.

Sherbrooke Exhibition : Jas. Boden, Ste. Anne de Bellevue, Que., and A. Drummond, Petite Cote, Que.

Quebec Exhibition : Horace Lamarche, St. Esprit, Que.; John Morrin, Belle Riviere, Que.

Life Members.

Hon. Thos. Ballantyne, Stratford ; Jos. Yuill, Carleton Place ; Jas. McCormack, Rockton ; John Morrin, Belle Riviere, Que. ; Jas. Drummond, Petite Cote, Que. ; Thos. Irving, North Germantown, Quebec. ; David Benning, Williamstown, Ont.

LIST OF MEMBERS.

Name.	Address.	Name.	Address.
Agricultural School.....	L'Assomption, Que.	Fraser, Alez. A.....	Breadalbane.
Agricultural School.....	Ste. Anne Pocatiere, Que.	Gaw, Jas	Sheffordvale, Que.
Aikenhead, John	Hartney, Man.	Gibbons, W. T	Northcote.
Archibald, C. A	Truro, N.S.	Gilroy, Jos	Lyn.
Angus, R. B	Ste. Anne de Bellevue, Que.	Girouard, Hilaire.....	Montreal, Que.
		Goverement Stock Farm	Charlottetown, P.E.I.
Armstrong, Jas.....	Shawville, Que.	Greenshields, J. N.....	Danville, Que.
Ballantyne, W. W.....	Stratford.	Greenway, Hon, Thos...	Crystal City, Man.
Baxter, David.....	North Georgetown, Que.	Guy, F. T	Darlington.
Baldock, Wm.....	Mount Charles.	Hamilton, John	Grand Freniere, Que.
Beatty, David	Chapman.	Hamilton, Wesley	Chesterville.
Begg, V. A	Moose Creek.	Harper, Mrs. Wm.....	Elbe Mills.
Benham & Son, Jesse ...	Sweetburg, Que.	Hay, John	Lachute, Que.
Benning, David.....	Williamstown.	Hay, William	Howick, Que.
Bell, Jas., M.D..... .	Montreal, Que.	Hearn, Michael.	Burke, N.Y., U.S.
Bell & Son, J. H	Farnham Centre, Que.	Hendy, Chas	Campbellford.
Black, Fred S	Amherst, N.S.	Hicks, Chas	Harrowsmith.
Blue, John	Eustis, Que.	Hill, Geo.....	Delaware.
Bogart, J. W	Morewood.	Hodson, F. W.....	Ottawa.
Bovyer, F. G.....	Georgetown, P.E.I.	Holmes, Mrs. S. E.....	Russell.
Bond, Hon. Robert	St. Johns, Nfld.	Howden, John.....	St. Louis de Gonzague, Q
Brooks, R. S	Brantford.	Hudson, Jos.....	Lyn.
Brownlee, Wm	McDonald's Corners.	Hume & Co., A.....	Menie.
Bryson, James	Brysonville, Que.	Hunt, John	Russell.
Bustard, Geo.....	Vicars, Que.	Hunter, Robert.....	Maxville.
Callander, Jas.....	North Gower.	Ingals, D. L	Dunboro', Que.
Campbell, John	Dalkeith.	Irving, Arch	Scotstown, Que.
Campbell, John R	Vernon.	Irving, Thos.. Jr	North Georgetown, Que
Carruthers, J. B.....	Kingston.	Jackson, F. J.....	Meadowvale.
Central Exp. Farm	Ottawa.	James, J. A..... .	Nilestown.
Charpentier Philias.....	L'Epiphanie, Que.	Johnson, D. B.....	Lansdowne.
Charlemagne & Lac Quareau Lumber Co ..	Charlemagne, Que.	Jones, Geo H.....	Bedford, Que.
		Justin, W. T.....	Lisgar.
Cleland, Arch	Hemmingford, Que.	Kains, A.	Byron.
Clark, J. G.....	Ottawa.	Kennedy & Son, Arch ..	Vernon.
Clark, Alex	Brimston's Corners.	Klock & Co., R. H	Klock's Mills.
Clow, John.....	Harrowsmith.	Knight, Joshua.....	Elginburg.
Clough, Wm.....	Campbellford.	Lachapelle, Napoleon...	St. Paul L'Ermite, Que.
Collison, Jas	Dixon's Corners.	Laferriere, J	St. Barthelemi, Que.
Coteau, E	Ste. Elizabeth, Que.	Lafortune, D. A ..... :	St. Laurent, Que.
Cottingham, Jas.....	Ormstown, Que.	Lamarche, Horace	St. Esprit, Que.
Crosby, John.....	Campbellford.	Lamarche, Geo.....	St. Lin, Que.
Crozier, Adam	Beachburg.	Lavallee, Paul.....	Berthier, Que.
Cumming, D	Russell.	Legris, Ulderic.....	St. Leon, Que.
Cumming, A. J.....	Heckston.	Leitch, David	Cornwall.
Cumming, Donald	Lancaster.	Lafebre, Jos.....	St. Eustache, Que.
Cunningham, John	Norval.	Lloyd, J. H.....	St. Lin, Que.
Davidson, Geo.....	Fairfax, Que.	Logan, J. W	Allan's Corners, Que.
Davis, Geo	Toronto.	Mackie, Wm	Agassiz, B.C.
Davis, Robert	Toronto.	Mackie Bros.....	Eburne, B.C.
Dawes & Co.....	Lachine, Que.	Marsh & Son, E.....	Gladstone.
Dawes, J. P.....	Lachine, Que.	Massicotte, Clair	St. Prosper, Que.
Denis, Arsene	St. Norbert, Que.	Massey, W. E. H..... .	Coleman.
Denzies. H. K.....	Foxboro.	Mellick, Aaron.....	Smithville.
Deschamps, Louis	St. Paul L'Ermite, Que.	Miller, William	Marshfield, P.E.I.
Dingwall, Jas	Williamstown.	Morrin, John.....	Belle Riviere, Que.
Donaldson, Jas.....	Dewittville, Que.	Morrin, Thos.....	Lachute, Que.
Douglas, John H	Warkworth.	Mousseau, A	Berthier, Que.
Drummond, A. McD....	Petite Cote, Que.	Muir, G. H.....	Montreal, Que.
Drummond, D.....	Myrtle.	Murphy, R. G.....	Elgin.
Drysdale, Thos	Allan's Corner's, Que.	Murphy, Jeremiah.....	Rockburn, Que.
Dundon, John.....	St. Roch, Que.	Murry, And.....	Clanbrassill.
Dyment, N.	Clappison's.	McCartney, Thos.....	Longburn, Man.
Eadie, John R	Russell.	McCallum, T. D.....	Danville, Que.
Easton, Ed. H	Lyn.	McCord, Jas.....	Prescott.
Easton Bros.....	Charlottetown, P.E.I.	McCormick & Son, Jas..	Rockton.
Edwards & Co., W. C...	Rockland.	McCullough, Jas.....	New Westminster, B.C.
Eyre, H. E.	Harlem.	McCubbin, Alex.....	Grande Freniere, Que.
Farlinger, W. K.....	Morrisburg.	McDonald, F. E.....	Bloomfield.
Fennell, R. G	Ormstown, Que.	McDonald, John.....	New Glasgow, N.S.

LIST OF MEMBERS.—*Continued.*

Name.	Address.	Name.	Address.
McDowell, Wm	Vicars, Que.	Sangster, R. R	Lancaster.
McFarlane, D. A.	Kelso, Que.	Savage, R. A	South Stukely, Que.
McFarlane, Robt	Riverfield, Que.	Scott, John	Austin, Minn., U.S.
McGuffin, W. J	Thorndale.	Simpson, Jas	South Augusta.
McIntosh, Peter	Cass Bridge.	Smith, A. W	Simcoe.
McKee, H. & J.	Norwich.	Smith, W. M	Scotland.
McLachlan, H. F	Amprior.	Snyder & Son, J. H	Attercliffe.
McLeod, John	Ridgeway.	Staples, L. F	Ida.
McLeod, W. D	Kirkhill.	Standish, Jas	Warden, Que.
McMaster, J. A	Montreal, Que.	Steacy, R. G	Lyn.
McMillan, D. E	Laggan.	Steel Bros	Glenboro, Man.
McMillan, D. P	Alexandria.	Stephen, W. F	Trout River, Que.
McMonagle, W	Sussex, N.B.	Sterling, T. W	Kelona, B.C.
McNiven Bros	Ancaster.	Stewart, Wm., Jr	Menie.
Ness, R. R	Howick, Que.	Taylor, F. W	Wellman's Corners.
Ness, Robert	Howick, Que.	Terrill, A	Wooler.
Nichol, Walter	Plattsville.	Thorn, Wm	Lynedoch.
Newton, John L	Chapman.	Thibaudeau, Damase	North Nation Mills, Que.
Ogilvie, W. W	Lachine Rapids, Que.	Tipping, J. A	Clarenceville, Que.
Oliver, Adam	St. Mary's.	Tisdale, N	Courtland.
Ontario Agricultural Col.	Guelph, Ont.	Tran, W. H	Cedar Grove.
Owens, Hon. Wm	Montreal, Que.	Tremble, A. H	Red Deer, Alta.
Parlee, M. H	Sussex, N.B.	Trudel, T	St. Prosper, Que.
Paton, Hugh	Montreal, Que.	Turenne, Delphis	St. Paul L'Ermite, Que.
Petar, Ed. T	Parkdale, Man.	Walker, Thos., Jr	Hoard's Station.
Pope, J. C	Regina, Assa.	Welch, W. G	Sun, N.Y., U.S.
Rathbun Co	Deseronto.	Wells & Son, A. C	Chilliwack, B.C.
Reford, Robt	Ste. Anne de Bellevue, Que.	Whittaker & Son, H. J	North Williamsburg.
		White Bros	Perth.
Reid, A. A	Escott.	Wilson, J. Lockie	Alexandria.
Reid & Co., R	Hintonburg.	Wood, And	Vankleek Hill.
Riel, J. B	St. Remi, Que.	Woodbury, Gordon	Manchester, N.H., U.S.
Rivet, Chas	St. Charles, Borromé, Que	Wooddisee Bros	Rothsay.
Robertson, R	Nappan, N.S.	Wooley, Wm	Howick, Que.
Robertson, R	North Georgetown, Que.	Wylie, William	Howick, Que.
Robertson, Adam	Como, Que.	Yates, Mahlon	Athens.
Roy, A	Riverfield, Que,	Yuill, Jos	Carleton Place.

ANNUAL MEETING.

The fourth annual meeting of the Canadian Ayrshire Breeders' Association was held at Richmond Hall, Toronto, February 5th, 1902, 2 p.m., President W. F. Stephen in the chair.

On motion of J. C. Smith, seconded by A. Kains, the minutes of the last annual meeting were taken as read. Carried.

REPORT OF THE SECRETARY-TREASURER.

Registrations. We have recorded 1,476 pedigrees this year, or four less than in 1900. I am afraid that the owners of Ayrshire cattle are not recording all their stock.

Members. We have 226 members this year against 190 last year, or a gain of 36; this is satisfactory, as each member gets a copy of the Herd Book.

Herd Books. Volume XI. is now in the hands of the printers; it contains 1,282 pedigrees, and will make a fair-sized volume. It will be ready for distribution shortly. The animals are numbered consecutively as they are received.

Exhibitions. The sum of $85.50 was paid to the Cattle Breeders' Association to make the members of this Association members of it, and this sum was apportioned for prizes to Ayrshire Cattle at the Guelph Winter Fair. There was a good exhibit of Ayrshires there, and they made a good record ; the money was all taken up. The show of Ayrshires at Toronto and the Pan-American was the best ever seen in Canada. They were well brought out at London, Ottawa, Sherbrooke, Quebec, and other large shows.

We received $53.13, or the last dividend of the Banque du Peuple, but I am sorry to say that we have not received the $250 promised by the Dominion Cattle Breeders' Association.

The Annual Meeting was held in Montreal last year, and seven directors were elected there for two years. This year it will be necessary to elect seven from the Western District. The Directors shall elect from among themselves six members to serve on the Executive Committee, three from the east and three from the west ; also a Revising Committee of five to investigate pedigrees.

FINANCIAL STATEMENT FOR THE YEAR ENDING DECEMBER 31, 1901.

Receipts.

Balance from 1900	$ 443.29
226 members at $2	452.00
Registration fees, 1,476 pedigreea, 454 transfers	1,362.50
Dividend from Banque du Peuple	53.13
	$2,310.92

Expenditure.

Printing and stationery	$ 23.25
Herd book	661.55
Premium to Winter Show	50.00
Cattle Breeders' Ass'n, for members	85.50
Tags, and duty on same	34.75
Montreal agency	34.55
459 pedigrees, 20c	91.80
73 transfers at 5c	3.65
Postage and stationery	10.25
Committee expenses	331.00
Commission	562.00
Postage	54.37
Auditor	10.00
Telegrams and sundries	22.29
Balance on hand	370.51
	$2,310.92

Assets.

Jan. 1, 1901.	
Balance cash on hand	$ 370.51
500 vols. Dom. Herd Book at $1	500.00
142 vols. Can. Herd Book at $1	142.00
204 v'ls. No. 9 Herd Book at $2	408.00
267 vols. No. 10 Herd B'k at $2	534.00
Total	$1,954.51

Liabilities.

Balance assets	$1,954.51
Total	$1,954.51

I hereby certify that I have examined the books and accounts of the Canadian Ayrshire Breeders' Association and the above statement is correct and in accordance therewith.

CHAS. F. COMPLIN, Auditor.

Toronto, Ont., January 24, 1902.

Moved by A. Hume, seconded by N. Dyment, "That the Secretary-Treasurer s report be adopted." Carried.

RESOLUTIONS.

The following resolutions were drawn up at the Directors' meeting, and submitted for approval at the Annual Meeting.

Moved by William Stewart, jr., seconded by N. Dyment, "That the three gentlemen who exhibited their cows in the Dairy Test at the Pan-American Exposition each receive a silver medal from this Association." Carried.

On motion of W. W. Ballantyne, seconded by A. Kains, it was resolved, "That we recommend the appointment of W. E. Skinner as Director of Live Stock at the World's Show at St. Louis in 1903, and that the memorial to the President, ex-Governor Francis, be signed by the President and Secretary of this Association on behalf of all the members."

A. Hume moved, seconded by William Stewart, "That the Secretary be instructed to get a supply of stationery for the Canadian Ayrshire Breeders' Association, with a proper heading, and that a moderate supply be sent to each of the Directors." Carried.

Moved by J. C. Smith, second by James Boden, "That this Association discontinue the use of ear tags." Carried.

On motion of J. C. Smith, seconded by James Boden, it was resolved "That the Canadian Ayrshire Breeders' Association are desirous of making a good exhibit at the coming World's Show in St. Louis, providing the Dominion and Provincial Governments give the same transportation facilities as were given at the Pan-American Exposition."

Moved by A. Hume, seconded by R. Hunter, "That the Canadian Ayrshire Breeders' Association request the Dominion Government to accept recommendations of judges from this Association." Carried.

ADDRESS BY W. F. STEPHEN, TROUT RIVER, QUE.

I am pleased to meet with you and congratulate you on the very successful year we Ayrshire breeders have had. I was pleased to learn of your successful meeting in Montreal last year, despite the severe snowstorm we had on that date. I regretted not being able to reach the city in time for the meeting, as, along with Mr. R. Ness and others, we were snowed up for ten hours within twenty miles of the city. I therefore had not an opportunity on that occasion of thanking you for the honor you conferred on me by electing me President of the Association. I therefore do so now. I have aimed to do my duty by the Association, but regret I was not in a position to do you more valuable service.

The opening year of the Twentieth Century has been a most successful one to Ayrshire breeders. The demand for large animals with good style and conformation, the cows with well developed udders and good sized teats, is ever on the increase, not only in our own fair Dominion, but with our cousins across the line as well. And were the U.S. Customs regulations less stringent our neighbors over there would doubtless be our greatest customers, and I am quite sure our sales would be considerably increased. The reasons for this demand I attribute to the high class of Ayrshires now being bred ; they being to-day possibly the best all-round farmer's cow ; in other words, the best commercial cow ; and I believe the future cow of Canada, as she best suits the needs of our farmers in the great and increasing dairy industry of our country. While we have reached a high standard of excellence, let us not only aim to hold the position we have gained, but aim to achieve even greater success in the future. We may do so if "we keep only the best, breed only the best, and sell only the best."

During the past year our Canadian Ayrshires kept up their reputation both in the show ring and the six months' dairy test at the Pan-American Exposition, held at Buffalo last summer. In competition with the herds from the United States, Canadian Ayrshires scored high, and were represented by four herds from the stables of Messrs.

W. W. Ogilvie, R. Reford, R. R. Ness and J. G. Clark, and we are proud to say carried off 75 per cent. of the prize money. In the dairy test we can claim nearly front place for our Ayrshires. While Guernseys came ahead in total profit in butter fat to the value of $13.42, the Ayrshires came ahead of them in total solids to the value of $32.95. And while the Holsteins came ahead in total solids to the value of $26.44, our Ayrshires came ahead of them in butter fat to the value of $7.12. This again proves to us that the Ayrshire cow is the best adapted for the every-day farmer, whether his product be butter or cheese, milk or cream for city trade. We find also that the Ayrshire herd was the most uniform in weight, in the amount of milk produced, butter fat test, pounds of butter made, amount of feed consumed and total profit. While this test, in a sense, may be conclusive, yet it is the first test of this kind ever held on the continent, if I mistake not, and is the only fair way in which a test can be made. I think the thanks of this Association are due to our Governments for paying cost of transportation to those breeders who gave their cows for the test, for the feed of our stock while at the Pan-American, and to those gentlemen who made the selections and those who so ably looked after the interests of our stock while there.

Should we have the privilege of exhibiting at the St. Louis Exhibition in 1903, I would suggest that selections of stock be made the coming season, so that we may know better the possibilities of the animals entering into the dairy test. Of course distance and climatic conditions may be against us exhibiting at St. Louis.

You will doubtless notice in our faithful Secretary's Report several gratifying features, viz., an increase of membership. The dividend from the Banque du Peuple has been received, and is larger than was anticipated, and that after paying for Volume 10 of our Herd Book (which is a large volume), and other current expenses, we have a balance on hand of $370.51, with our grant of $250 still to come from the Cattle Breeders' Association.

I fear the ear tags we use at present are not giving the best of satisfaction, as they frequently pull out and get lost ; some herds have already lost over half of them. It would be well to discuss this matter, and if there is a better tag, why not use them?

Two of the Stock Auction Sales have already been held, and have been fairly successful, and two others have been arranged for next month. It rests with the breeders themselves to make these sales a success.

NEW BUSINESS.

Moved by J. C. Smith, seconded by William Stewart, jr., "That this Association make each member a member of the Dominion Cattle Breeders' Association by paying 50 cents per member, and that the amount go towards prizes at the Provincial Winter Fair ; also that two representatives be allowed from this Association on the Board of the Cattle Breeders' Association." Carried.

On motion of W. W. Ballantyne, seconded by James Boden, it was resolved : "That the Canadian Ayrshire Breeders' Association, in annual meeting assembled, request the Secretary to urge on Mr. F. W. Hodson, Dominion Live Stock Commissioner, and the Secretary of the Cattle Breeders' Association, to pay the $250 which was promised by the Live Stock Commissioner, to help in defraying the heavy expenses incurred during amalgamation."

Mr. James McCormack brought up the matter of one or two Ayrshire cattle not being able to record in the American Book on account of their having two or more imported dams given in the Canadian Book. The American Secretary would not record them unless one dam was given.

Moved by J. C. Smith, seconded by W. W. Ballantyne, "That this matter be left in the hands of the Revising Committee, with instructions to act as soon as possible, in order to ascertain which dam was the mother of the animals held in abeyance by the American Secretary." Carried.

Moved by A. Hume, seconded by W. W. Ballantyne, "That the Revising Committee give in a report at the next annual meeting." Carried.

The meeting then adjourned.

PRIZE WINNING AYRSHIRES AT THE TORONTO INDUSTRIAL EXHIBITION, 1901.

Bull, 3 years old and upwards.

1st. Lord Dudley of Drumsnie, (imp.)—12293—(3945) brown and white, calved April, 1897. Bred by Wm. Walker, Drumsnie, Coylton, Scot.; sire, Brown's Chief of Drumsnie (3803); dam, Bloomer of East Drumsnie. Exhibitor, R. Reford, St. Anne de Bellevue, Que.

2nd. Dorylasdale of Dam of Aber (imp.)—12212—(3954), calved April, 1897. Bred by R. M. Kinlay, Hillhouse, Sandilands, Scot.; sire, Douglas Chief of Hillhouse (3400); dam, Snowdrop of Hillhouse (5911). Exhibitor, W. W. Ogilvie & Co., Lachine Rapids, Que.

3rd. Duke of Clarence of Barcheskie (imp.)—13252—(4168) white and brown, calved April 14, 1898. Bred by A. Mitchell, Barcheskie, Kirkcudbright, Scot.; sire, Mischief-maker of Barcheskie (3892); dam, Judy 5th of Barcheskie (8457). Exhibitor, R. Ness, Howick, Que.

4th. The Don, 8855, white and brown spotted, calved October 14, 1897. Bred by Robert Robertson, Nappau, N.S.; sire, Matchless, 7560; dam, Lady Topsy, 8756. Exhibitor, R. B. Angus, Sennville, Que.

Bull, 2 years old.

1st. Hover-a-Blink 9806, white, with red markings, calved August 5, 1898. Bred by exhibitors; sire, Dainty Lad of Elmshade—2245—; dam, Jean Armour—2058—. Exhibitors, W. Stewart & Son, Menie, Ont.

2nd. Black Prince of Whitehill (imp.)—12208—dark brown and white, calved April, 1899. Bred by Robt. Woodburn, Jr., Whitehill, Galton, Scot.; sire, Prince Robert of Holehouse (4021); dam, Nora 2nd of Holehouse (9725). Exhibitors, W. W. Ogilvie & Co., Lachine Rapids, Que.

3rd. Defender of Ste. Anne's 9998, white, with small red spots on neck; calved August 19, 1898. Bred by exhibitor; sire, Napoleon of Auchenbrain (imp.)—8303—; dam, Snowdrop of Ste. Anne's—7908—. Exhibitor, Robt. Redford, St. Anne de Bellevue, Que.

4th. White Cockade—10492—mostly white, with some brown spots: calved February 25, 1899. Bred by exhibitors; sire, Dainty Lady of Elmshade—2245—; dam, Lady McNeil—1964—. Exhibitors, A. Hume & Co., Menie, Ont.

Bull, 1 year old.

1st. General White—12910—white, with brown spots, calved December, 1899. Bred by exhibitor; sire, Glencairn of Maple Grove (imp. in dam)—6973—: dam, Woodroffe Dairy Maid—3437—. Exhibitor, J. G. Clark, Ottawa, Ont.

2nd. Royal Peter of Ste. Anne's (imp. in dam)—13140—white, black checks; calved April 14, 1900. Bred by A. Mitchell, Barcheskie, Scot.; sire, Peter of Nether Craig (4104); dam, Mayflower 4th of Barcheskie (imp.)—12290—(13164). Exhibitor, R. Reford, Ste. Anne de Bellevue, Que.

3rd. Lord Minto of Burnside—11744—white and little brown; calved September 15, 1899. Bred by exhibitor; sire, Goldfinder (imp. in dam); dam, Gertie of Maple Cliff—8750—. Exhibitor, R. Ness, Howick, Que.

4th. Royal Salute—12061—spotted white and brown, calved September 29, 1899. Bred by exhibitors; sire Waverley—11350—; dam, Primrose 9th—3012—. Exhibitors, James McCormack & Sons, Rockton, Ont.

Bull Calf, under 1 year.

1st. Beauty Style's Heir—11204—white and brown, spotted, calved September 15, 1900. Bred by exhibitor; sire, Beauty Style of Auchenbrain (imp.)—1129—(2758)—; dam, Lady of the Lake—8955—. Exhibitor, R. S. Brooks, Brantford, Ont.

2nd. Comrade's Last of Glenora—13474—white and dark brown; calved August 23, 1900. Bred by exhibitors; sire, Comrade of Garlaff (imp.)—9183—(3551); dam, Faultless Beauty of Wynholm (imp.)—9167—(11776). Exhibitors, W. W. Ogilvie & Co., Lachine Rapids, Que.

3rd. Lady Ottawa's White Prince—12750—white with brown markings, calved September 9, 1900. Bred by exhibitors; sire, The Miller o' the Dee—10422—; dam, Lady Ottawa—3001—. Exhibitors, W. Stewart & Son, Menie, Ont.

4th. Marquis of Woodroffe—12945—red and white, calved September 27, 1900. Bred by exhibitor; sire, Glencairn of Maple Grove (imp. in dam)—6973—; dam, Topsy—2595. Exhibitor, J. G. Clark, Ottawa, Ont.

Bull Calf, calved after February 1, 1901.

1st. Dunraven of Ste. Anne's. Bred by exhibitor; sire, Lord Dudley of Drumsnie—12293—; dam, Annie Rooney of St. Anne's—9328—. Exhibitor, R Reford, Ste. Anne de Bellevue, Que.

2nd. Bold Boy. Bred by exhibitors; sire, Caspian of Ste. Anne's, 8893 dam, Nell of Park Hill—2091—. Exhibitors, R. Hume & Co., Menie, Ont.

3rd. Bold Boy. —14456—; red and white ; calved March 4th, 1901. Bred by exhibitor; sire, Matchless of Woodroffe—10388— ; dam, Lalla Rookh—14455—. Exhibitor, J. G. Clark, Ottawa.

4th. Glen Allan of Ste. Anne's. Bred by exhibitor ; sire, Glencairn 3rd 6955 ; dam, Bell 1st of Fairfield Mains (imp.) 12286 (12665). Exhibitor, R. Reford, Ste. Anne de Bellevue, Que.

BULL, ANY AGE.

1st. Lord Dudley of Drumsnie (imp.) 12293—(3915. Exhibitor, R. Redford, Ste. Anne de Bellevue, Que.

COW, 4 YEARS OLD AND UPWARDS.

1st. White Rose of Barmoorhill (imp.)—12227—(5042), white, brown spots, calved March 16, 1893, Bred by D. Gray, Barmoorhill, Tarbolton, Scot.; sire, Young Kyle of Tongue (2607) ; dam, Forget-Me-Not 2nd of Barmoorhill (5683). Exhibitors, W. W. Ogilvie & Co., Lachine Rapids, Que.

2nd. Snowdrift of Barcheskie (imp.)—12291—(10481) white, calved March, 1892. Bred by Thomas Scott, Netherall, Sandilands, Lanark, Scot ; sire, adjutant of South Cumberland (1819) ; dam, Kate 2nd of Netherall. Exhibitor, R. Redford, Ste. Anne de Bellevue, Que.

3rd. Dandy Lass of Nethercraig (imp)—12211—(13382) white and brown, calved March, 1897. Bred by R. F. J. Hunter, Foulton Monkton, Scot. ; sire, Plise of Knockdon (2112); dam, Tibbie of Foulton [3823). Exhibitors, W. W. Ogilvie & Co., Lachine Rapids, Que.

4th. Snowdrop 1st of Fairfield Mains (imp.)—12283—(12655) calved March, 1894. Bred by Thomas Howie, Fairfield Mains, Monkton, Scot.; sire, Orange Bob of Orangefield Mains (2424); dam, Snowdrop of Towend. Exhibitor, R. Reford, Ste. Anne de Bellevue, Que.

COW, 3 YEARS OLD.

1st. May Mitchell—9237—white, with red markings, calved January 12, 1898. Bred by exhibitors ; sire, Douglas of Londoun—1384—; dam, White Floss of Menie—9589—. Exhibitors, W. Stewart & Son, Menie, Ont.

2nd. Bluebell 27 of Hillhouse (imp.)—12287—(13162), calved May, 1898. Bred by James Howie, Hillhouse, Kilmarnock, Scot.; sire, Traveller's Heir of Holehouse (2903) ; dam, Bluebell of Hillhouse. Exhibitor, R. Reford, Ste. Anne de Bellevue, Que.

3rd. Miss Scottie of B.—13469—white and red, calved August 3, 1897. Bred by exhibitor ; sire, Harcourt of B.—7890— ; dam, Lady Scottie of P. H.—5570—. Exhibitor, R. Ness, Howick, Que.

4th. Lady Spottie of B.—9071—white, and brown spots, calved September 10, 1897. Bred by exhibitor ; sire, Harcourt of B.—7890— ; dam, Spottie of Burnside—8478—. Exhibitor, R. Ness, Howick, Ont.

HEIFER, 2 YEARS OLD.

1st. Lady Grace of Ste. Anne's—11729—white, with some red spots, calved April 14, 1899. Bred by exhibitor ; sire, Glencairn 3rd (imp.)—1658— ; dam, Grace Darling—6170—. Exhibitor, R. Reford, Ste. Anne de Bellevue, Que.

2nd. Nelly Osborne 3rd of Ste. Anne's—10010—white, with red checks, calved August 12, 1898. Bred by exhibitor ; sire, Kelso Boy—6229— , dam, Nellie Osborne (imp.)—5358—. Exhibitor, R. Reford, Ste. Anne de Bellevue, Que.

3rd. Lady Harcourt—13466—, white and little red, calved August 2, 1898. Bred by exhibitor ; sire, Harcourt of B.—7890—; dam, Lady Lockerby—8487—. Exhibitor, R. Ness, Howick, Que.

4th. Stately 9th of Muir (imp) —12221— (13391) brown and white, calved March, 1899. Bred by Jas. Murray, Muir, Cumnock, Scot. ; sire, Wee Earl of Brombead (3253) ; dam, Stately 5th of Muir (7895). Exhibitors, W. W. Ogilvie & Co , Lachine Rapids, Que.

HEIFER, 1 YEAR OLD, IN MILK.

1st. Topsy Bell —14090— red and white, calved Aug. 15. 1899. Bred by exhibitor ; sire, Glencairn of Maple Grove (imp. in dam) ; dam, Topsy —2595—. Exhibitor, J. G. Clark, Ottawa, Ont.

2nd. Malvern Maid —12118— light red and white, calved Aug. 3, 1898. Bred by Jno. Laurie, Malvern, Ont. ; sire, Laurier —2295— : dam, Annie 2nd, —12117—. Exhibitor, W. E. H. Massey, Coleman, Ont.

HEIFER, 1 YEAR OLD, OUT OF MILK.

1st. Lady Bruce —12087— white and little brown, calved Sept. 22, 1899. Bred by exhibitor ; sire, Goldfinder (imp. in dam) —10745— dam, Minnie of Burnside —6281—. Exhibitor, R. Ness, Howick, Que.

2nd. Glenora Stately —11425— white and red, calved Sept. 15, 1889. Bred by exhibitor ; sire, Comrade of Garlaff (imp.) —9183— ; dam, Edith of Lessnessock (imp.) —9166—. Exhibitors, W. W. Ogilvie & Co., Lachine Rapids, Que.

3rd. Princess of Ste. Anne's —11741— brown and white, calved Sept., 1899. Bred by exhibitor ; sire, Napoleon of Auchenbrain (imp.) —8303— ; dam, Heather Belle of Ste. Anne's —9331—. Exhibitor, R. Reford, Ste. Anne de Bellevue, Que.

4th. Glenora Ayrshire Lassie —11419— white and red, calved Oct. 15, 1899. Bred by exhibitor ; sire, Comrade of Garlaff (imp.) —9183— ; dam, Miss Ida of Garlaff (imp.) —9184—. Exhibitors, W. W. Ogilvie & Co., Lachine Rapids, Que.

HEIFER CALF, UNDER 1 YEAR OLD.

1st. Lady Beatrice of Glenora—13485—white and brown, calved Aug. 8, 1900. Bred by exhibitors ; sire Comrade of Garlaff (imp.)—9183—(3551) , dam, Georgina 2nd of Wynholm (imp.)—9168—. Exhibitors, W. W. Ogilvie & Co., Lachine Rapids, Que.

2nd. Marguerite of Burnside—13468—white and red, calved Aug. 11, 1900. Bred by exhibitor ; sire, Goldfinder (imp.)—10745— ; dam, Lady Spottie of Burnside—9071—. Exhibitor, R. Ness, Howick, Que.

3rd. Bright Lady Glenora—13482—white and brown, calved Aug. 21, 1900. Bred by exhibitors ; sire, Comrade of Garlaff (imp.)—9193— ; dam, Edith of Lessnessock (imp.)—9166—. Exhibitors, W. W. Ogilvie & Co., Lachine Rapids, Que.

4th. Princess of Ste. Anne's—13138—white, with red cheeks, calved Sept. 2, 1900. Bred by exhibitor ; sire, Glencairn 3rd (imp.)—6955— ; dam, Anne of Barcheskie (imp.)—5357—. Exhibitor, R. Reford, Ste. Anne de Bellevue, Que.

HEIFER CALF, CALVED AFTER FEBRUARY 1ST, 1901.

1st. The Gipsy of Menie—13656—nearly red with small white spots, calved Feb. 9, 1901. Bred by exhibitors ; sire, Caspian of Ste. Anne's 8893 ; dam, Primrose,—3507—. Exhibitors, A. Hume & Co., Menie, Ont.

2nd. Lady Pearl of Burnside—13467—white and red, calved April 26, 1901. Bred by exhibitor ; sire, Duke Clarence of Barcheskie (imp.)—12620— ; dam, Pearl of Woodside—7423—. Exhibitor, R. Ness, Howick, Que.

3rd. Bud of Woodroffe—13268—white, small red spots, calved Feb. 8, 1901. Bred by exhibitor ; sire, Matchless of Woodroffe—10838— ; dam, Blossom of Woodroffe—13185—. Exhibitor, J. Clark, Ottawa, Ont.

4th. Silver May of Dentonia—13665—red and white, calved April 11, 1901. Bred by exhibitor ; sire, Silver Prince of St. Louis—7939— ; dam, Spring Brook Maggie—6022—. Exhibitor, W. E. H. Massey, Coleman, Ont.

FOUR ANIMALS, THE PROGENY OF ONE BULL, ALL BRED AND OWNED BY EXHIBITOR.

1st. Exhibitor, R. Ness, Howick, Que.
2nd. " R. Reford, Ste. Anne de Bellevue, Que.
3rd. " W. W. Ogilvie & Co., Lachine Rapids, Que.
4th. " R. Ness, Howard, Que.

HERD OF BULL AND 3 HEIFERS, UNDER 2 YEARS OLD, HEIFERS TO HAVE BEEN ALL BRED AND OWNED BY EXHIBITOR.

1st. Exhibitor, R. Ness, Howick, Que.
2nd. " W. W. Ogilvie & Co., Lachine Rapids, Que.
3rd. " R. Reford, Ste. Anne de Bellevue, Que.
4th. " J. G. Clark, Ottawa, Ont.

HERD OF BULL ANY AGE, 2 FEMALES OVER 3 YEARS OLD, 1 FEMALE OVER 2 AND UNDER 3, 1 FEMALE OVER 1 AND UNDER 2, 1 FEMALE UNDER 1 YEAR.

1st. Exhibitor, R. Reford, Ste. Anne de Bellevue, Que.
2nd. " W. W. Ogilvie, Lachine Rapids, Que.
3rd " R. Ness, Howick, Que.
4th. " W. W. Ogilvie & Co., Lachine Rapids, Que.

FEMALE, ANY AGE.

1st. White Rose of Barmoorhill (imp.)—12227—(12558). Exhibitors, W. W. Ogilvie & Co., Lachine Rapids, Que.

CANADIAN HEREFORD BREEDERS' ASSOCIATION.

ANNUAL MEETING.

The eleventh annual meeting of the Canadian Hereford Breeders' Association was held at the Royal Hotel, Guelph, on December, 1901, the President, W. H. Hunter, "The Maples," in the chair.

In his opening remarks President Hunter referred to the fact that this was one of the best attended meetings in the history of the Association. He also pointed out that the steps taken to improve the Hereford breed were meeting with great success. A brighter day was dawning for that breed, and the outlook was most hopeful.

SECRETARY'S REPOPRT.

This has been a favorable year for the owners of Herefords. Sales have been good both in Canada and the United States, quite a number having been sold by W. H. Hunter and the Wm. Stone Estate to go to Texas, at good prices. Mr. H. D. Smith also sold at the Chicago Hereford Sale last week several at an average of over $700. I did not keep a memorandum of the name of the cow that sold for $4,500 at that sale, but will get it before the report is printed. This breed also had the honor of winning the Grand Championship, a class in which the breeders of the world are interested. It means much to the breed to win a Championship when all breeds are competing. The three competing breeds were Herefords, Shorthorns and Angus. The Herefords won. Last year it was an Angus that took first place. The winning animal is Woods' Principal, a pure-bred Hereford yearling by Pride of Evergreen, 51882, out of Pretty Face 2nd, 41063. The owner is George P. Henry of Goodenow, Ill., a young man recently graduated from Yale. He has learned all about breeding Hereford steers for the block and feeding to win big prizes. Mr. Henry distinguished himself as a feeder at leading state fairs this year by winning a majority of the blue ribbons. George P. Henry of Goodenow, Ill., owner of Woods' Principal, received $822.50 for him, the weight being 1,645 pounds. This is in addition to the prizes he won. So great was the crushing to witness the auction of the Woods' Principal, champion fat steer of this year's International Live Stock Exposition that an alarm was sent for police. Packed into the pen opposite the Exchange building, where he was sold, were several thousand men and women, each anxious to see and hear the performance. In the crush the star of the event was in imminent danger of asphyxiation.

Woods' Principal was sold for 50 cents a pound to S. M. Swenson & Sons, brokers at 15 Wall street, New York. Mr. Swenson wil distribute the resulting steaks and roasts to his friends for Christmas. But three bids were made: Armour & Co., offering 25 cents a pound; "Tom" Southam, 26 cents, and the successful Swenson bid.

Last year Advance, the champion steer, brought $1.50 a pound, but the Hereford men explain that the sale was under different conditions, as this year the champion must be killed here for the carcass test, while last year Advance was taken east alive, giving the investment an advertising value.

Herd Book. We have now 1,050 pedigrees ready to print in Volume 2, or one-third as many as are in Volume 1. Would advise the Directors to have it printed next year.

Registrations. We have been paid for 263 registrations and 127 transfers during the last year, 37 less than the previous year. If we compelled exhibitors at the Industrial Exhibition to record with us as requested by that Association, it would increase our numbers materially.

Membership. The roll has increased this year, we having 35 paid ones against 30 last year.

FINANCIAL STATEMENT ENDING NOVEMBER 30, 1901.

RECEIPTS.		EXPENDITURE.	
1900.—Nov. 30.		1901.—Nov. 30.	
To balance from previous year...	$234.04	By Commission, 263 pedigrees and 127 transfers	$104.75
1901.—Nov. 30.		Printing and stationery.....	19.20
Reg. fees to date, on 263 regs. and 127 transfers..	242.50	Postage and telegrams.....	7.12
Cash, 35 members at $2.00 each.	70.00	Stenographer and testimonial..	8.00
		Balance cash on hand..	407.47
	$546.54		$546.54

H. WADE, Secretary-Treasurer.

OFFICERS FOR 1902.

President : W. H. Hunter, "The Maples."

Vice-President : A. Stone, Guelph.

Vice-Presidents for the Provinces : Messrs. J. A. McDermid, Stayner (Ontario); H. D. Smith, Compton, Que. (Quebec); J. A. Chapman, Beresford, Man. (Manitoba); W. W. Black, Amherst, N.S. (Maritime Provinces).

Directors : A. Rawlings, Forest; A. S. Hunter, Durham ; F. Copland, Harriston ; A. H. O'Neill, Southgate; Mossom Boyd, Bobcaygeon ; W. H. Hammell, Beeton ; H. Reid, Mimosa ; Asa Warnick, Painswick.

Delegates to the Industrial Ehibition, Toronto : W. H. Hunter and W. H. Hammell. Delegate to Ottawa : Mosson Boyd. Delegate to London : H. Wade, R. Stutt, Forest. Delegate to Winnipeg : J. A. Chapman, Beresford, Man. Secretary and Editor : Henry Wade, Toronto.

LIST OF MEMBERS.

Black, W. W., Amherst, N.S.
Boyd, Mossom, Bobcaygeon.
Campbell, R. A., Canyon, Texas.
Chapman, J. A., Beresford, Man.
Combs & Worley, Amarillo, Texas.
Coon, C. B., Sidney, B.C.
Copland, F. M., Harriston.
Curry, J., Newmarket.
Davidson Bros., Anagance, N.B.
Elliott, Wm., Porter's Hill.
McFarlane, Geo., Russell, Man.
Govenlock, John, Forest.
Hall, H. B., Gagetown, N.B.
Hammell, W. H , Beeton.
Hanna, E. W., Griswold, Man.
Harrell, E. D., Canyon, Texas.
Hudson, F. W., Ottawa.
Hunter, W. H., The Maples.
Jackson, J. S., Eramosa.
Lambert, R., Kennell, Assa.
Leak, Wm., Watford.
LeBoutillier, Peter, Minnedosa, Man.
Londy, L., Sault Ste. Marie.
Lovering, J. A., Coldwater.
Marples, J. E., Deleau, Man.
Mille & Son, F. B., Solsgirth, Man.
McLean, W. J., Elmgrove.
McDermid, J. A., Stayner.
McDermid, P. T., Duntroon.
O'Neill Bros . Southgate.
Palmer, T. M., Medicine Hat, Assa.
Reaman, Isaac, Concord.
Reid, Thos. H., Holstein.
Stone, A., Guelph.
Stone Stock Co. (The), F. W., Gnelph.
Srigley, John, Allandale.
Stutt, R. & J., Forest.
VanVeen, J., File Hills, Assa.
Wallace, —, Cartwright, Man.
Warnica, Asa, Painswick.
Webb, Geo., St. Helens.

RESOLUTIONS.

The following resolutions were adopted :

That the editor, Mr. H. Wade, be authorized to publish the second volume of the Canadian Hereford Herd Book.

That the Canadian Hereford Breeders' Association join the Dominion Cattle Breeders' Association on the same terms as the Dominion Shorthorn Association has already done, and that Messrs. W. K. Gooding and A. Stone be appointed representatives from this Association to the Provincial Winter Fair.

That this Association will be pleased to have the managers of the St. Louis World's

Fair appoint Mr. W. E. Skinner of Chicago, a member of the International Live Stock Association, as manager of the Live Stock Department of that World's Fair, and that the President and Secretary sign a memorial to that effect.

That this Association resolve that the Dominion Government be petitioned to change the present Veterinary Act as regards the restrictions on shipping between Britain and Ontario, and also to the United States, and that a deputation be appointed by this Association to act with the Shorthorn Breeders' Association, in this matter. The President and Secretary were appointed to act under this resolution.

HEREFORDS AT THE INDUSTRIAL EXHIBITION, 1901.

The white faces came out in stronger force than for many ears, and were judged by Prof. G. E. Day and Mr. Richard Gibson. For the first time the Maritime Provinces contributed a contingent, in the excellent herd of Mr. W. W. Black of Amherst, N.S., headed by the well-known show and stock bull, Sir Horace, a sweepstakes winner here in former years in the hands of Mr. H. D. Smith of Compton, Que., on whose herd he left his impress on a uniformly excellent progeny. He was a typical Hereford of the first rank, with model head and horns, short limbs, well-balanced form, and the best quality of flesh and hair, and holds an unbeaten record in the Eastern Provinces as a Championship winner for three or four years. He had to meet and contend for supremacy of place with his successor in the Ingleside herd of Mr. Smith, the redoubtable "Mark Hanna," 74230, Champion at the Industrial for the last three years. Mark Hanna again won first in his class, and the Championship. Sir Horace, 63688, made a worthy second, and the F. W. Stone Stock Company of Guelph had a capital entry in Imported Baronet, [1292], who won third place, making a trio of bulls that has seldom been equalled at this centre. A strong contest was that in the section for two-year-old bulls, between Mr. Smith's "Prince of Ingleside 2nd," 93917, by Sir Horace and Young Actor, [1250], by Actor, bred by Van Natta & Son, of Indiana, and shown by W. H. Hunter of The Maples, Ont. Both were exceedingly good bulls, strong in all the best characteristics of the breed, and after due consideration the judges placed them in the order in which are named. In yearling bulls the Stone Company had a worthy winner in Clarence 2nd [109040], and Mr. Black a close second in a son of Sir Horace Grover [1350], while The Maples herd contributed in "March On 2nd," [1470].

In an unusually strong class of bull calves under a year, The Maples herd furnished the winner in "Harry Maple" [1473], son of Imported Belswardyne Lad [871].

The Nova Scotia herd (W. W. Black) headed the prize list in the cow class with Starlight, 56723, a seven-year-old daughter of Maple Grove, and a fresh-looking cow of splendid style, smooth and even in conformation, and brought out in excellent condition. Ingleside had a good second in Sylvan 5th, 63624, of fine type ; while "Belle of the Ball," [1245] of the Maples herd, filled third place worthily.

In three-year-old cows there were but two entries, but they were good ones, and "Laura of Ingleside," 83591, won the red ribbon, the second award going to Duchess of Morteon 2nd, 83949, of the Stone Company string.

In two-year-old heifers, Mr. H. D. Smith won with "Rubella," 93920, by Sir Horace, and out of Lady Rupert, her herd mate. Amy of Ingleside, 93909, by Mark Hanna, was second, and Lilly Horace [1705], another daughter of Sir Horace in Mr. Black's herd being placed third.

The Ingleside herd furnished the three winners in the section for yearling heifers, Downton Ingleside 2nd, by Mark Hanna, and out of Lady Bountiful, a splendid entry, being considered by the judges the best female in the class, and worthy of not only the first place in her section, but the Championship. Two daughters of Sir Horace won first and second for Mr. W. W. Black in the heifer section, the third going to Ingleside. The herd prizes for best bull and four females were awarded as follows : 1st, H. D. Smith, Compton, Que.; 2nd, W. W. Black, Amherst, N.S.; 3rd H. D. Smith, Compton, Que.

PRIZE WINNING HEREFORDS AT THE TORONTO INDUSTRIAL EXHIBITION, 1901.

Bull, 3 years old and upwards.

1st. Mark Hanna 74320, calved Oct. 10,1896. Bred by W. S. VanNatta, Fowler, Ind.; sire, Eureka 58549 dam, Miss Lark 30995. Exhibitor, H. D. Smith, Compton, Que.
2nd. Sir Horace 63688, calved April 4, 1895. Bred by Sotham & Co., Chillicotte, Mo. ; sire, Corrector 48976 ; dam, Princess Jenny 22579. Exhibitor, W. W. Black, Amherst, N.S.
3rd. Baronet [1292], calved Jan. 13, 1898. Bred by A. P. Turner, Pembridge, Hereford, Eng. ; sire, Statesman (14948) ; dam, Cordelia (84152). Exhibitor, Stone Stock Co., Guelph, Ont.

Bull, 2 years old.

1st. Prince of Ingleside 2nd 93917, calved Oct. 22, 1898. Bred by exhibitor ; sire, Sir Horace 63688 ; dam, Princess Bonnie 61779. Exhibitor, H. D. Smith, Compton, Que.
2nd. Young Actor 94498, calved Nov. 22, 1898. Bred by W. S. VanNatta & Son, Fowler, Ind. ; sire, Actor 45608 ; dam, Lady Grace 69206. Exhibitor, W. H. Hunter, The Maples, Ont.

Bull, 1 year old.

1st. Stone's Clarence 2nd 109049. Bred by F. W. Stone, jr., Guelph, Ont ; sire, Clarence 77926 ; dam, Sweetheart 33rd 100988. Exhibitor, Stone Stock Co., Guelph, Ont.
2nd. Grover [1350], calved Feb. 4, 1900. Bred by exhibitor; sire, Sir Horace [845]; dam, Gratia 3rd [904]. Exhibitor, W. W. Black, Amherst, N.S.
3rd. March On 2nd [1470], calved July 11, 1900. Bred by W. S. VanNatta & Son, Fowler, Ind., sire, March On [1279]; dam, Minnie [1627]. Exhibitor, W. H. Hunter, The Maples, Ont.

Bull Calf, under 1 year.

1st. Captain Jack [1380] calved Oct. 29. 1900. Bred by W. S. VanNatta & Son, Fowler, Ind.; sire, Christopher [1274] , dam, Breuda 4th [1668]. Exhibitor, W. H. Hunter, The Maples, Ont.
2nd. Bruce 122038. Bred by exhibitor ; sire, Sir Horace 63688 ; dam, Barbara 3rd 51494. Exhibitor, W. W. Black, Amherst, N.S.
3rd. Baronet's Pride 115602. Bred by exhibitor ; sire, Baronet 100989 ; dam, Peach 24th 63843. Exhibitor, Stone Stock Co., Guelph, Ont.

Bull, any age.

1st. Mark Hanna 74230. Exhibitor, H. D. Smith, Compton, Que.

Cow, 4 years and upwards.

1st. Starlight 56723. Bred by C. H. Hackett, Compton, Que.; sire, Maple Grove 42509; dam, Fannie Field 26016. Exhibitor, W. W. Black, Amherst, N.S.
2nd. Sylvan 5th of Ingleside 63624, calved Feb. 24, 1895. Bred by exhibitor ; sire, Pinkham of Ingleside 53398 ; dam, Spot 3rd 48222. Exhibitor, H. D. Smith, Compton, Que.
3rd. Belle of the Ball [1248], calved March, 1896 ; sire, Sporting Doctor (16411) ; dam, Ballet Dancer. Exhibitor, W. H. Hunter, The Maples, Ont.

Cow, 3 years old.

1st. Laura of Ingleside 83597, calved Oct. 29, 1897. Bred by exhibitor ; sire, Sir Horace 63688 ; dam, Nadjy of Ingleside 53997. Exhibitor, H. D. Smith, Compton, Que.
2nd. Duchess of Moreton 22nd 83949, calved Oct. 11, 1897. Bred by F. W. Stone, Guelph, Ont.; sire, Barbette 68977 ; dam, Duchess of M. 14th 58638. Exhibitor, Stone Stock Co., Guelph, Ont.

Heifer, 2 years old.

1st. Rubella of Ingleside 93920, calved Oct. 22, 1898. Bred by exhibitor ; sire, Sir Horace 63688 ; dam, Lady Rupert. Exhibitor, H. D. Smith, Compton, Ont.
2nd. Amy of Ingleside 93909, calved Feb. 13, 1899. Bred by exhibitor; sire, Mark Hanna 74230; dam, Amy 3rd 43430. Exhibitor, H. D. Smith, Compton, Que.
3rd. Lilly Horace [1305] calved Dec. 22, 1898. Bred by exhibitor ; sire, Sir Horace [845] ; dam, Lillian [903]. Exhibitor, W. W. Black, Amherst, N.S.

Heifer, 1 year old.

1st. Dountown Ingleside 2nd 124050. Bred by exhibitor; sire, Mark Hanna 74230; dam, Lady Bountiful. Exhibitor, H. D. Smith, Compton, Que.
2nd. Frivolity 2nd of Ingleside 102704, calved Oct. 25, 1899. Bred by exhibitor; sire, Mark Hanna 74230; dam, Frivolity 78779. Exhibitor, H. D. Smith, Compton, Que.
3rd. Roseleaf 2nd of Ingleside 114400. Bred by exhibitor ; sire, Mark Hanna 74230 ; dam, Roseleaf. Exhibitor, H. D. Smith, Compton, Que.

Heifer Calf, under 1 year.

1st. Stella 122040. Bred by exhibitor ; sire, Sir Horace [845] 63688 ; dam, Starlight 56723. Exhibitor, W. W. Black, Amherst, N.S.
2nd. Lady Horace [1867], calved Nov. 20, 1900. Bred by exhibitor ; sire, Sir Horace [845] 63688 ; dam, Lillian [903]. Exhibitor, W. W. Black, Amherst, N.S.
3rd. Frivolity 3rd of Ingleside 124051. Bred by exhibitor ; sire, Mark Hanna 74230 ; dam, Frivolity. Exhibitor, H. D. Smith, Compton, Que.

Herd of 1 Bull and 4 Females, over 1 year.

1st. Exhibitor, H. D. Smith, Compton, Que.
2nd. " W. W. Black, Amherst, N.S.
3rd. " H. D. Smith, Compton, Que.

Female, any age.

1st. Dountoun Ingleside 2nd 124050. Exhibitor, H. D. Smith, Compton, Que.

GREAT EASTERN EXHIBITION, QUEBEC, 1901.

Exhibitors were Mr. H. D. Smith, of Compton, Que., and D. M. Wilson of Moe's River, Que.

The Ingleside herd won all first, both herds and diplomas, on a string of well brought out cattle.

THE WINNIPEG INDUSTRIAL EXHIBITION WINNERS, 1901.

With the incentive of a strong demand and good prices, the white-faces have for several years been putting up a constantly improving show, and this year made the best exhibit of the breed that has been seen at the Winnipeg Industrial. The stock showed more quality and finish, particularly in the older sections, than has before been noticed, and throughout a most creditable breed exhibit was made.

The exhibitors were : J. E. Marples, Deleau, Man.; John Wallace, Cartwright, Man.; J. A. Chapman, Beresford, Man., and W. Purdy, of Lumsden, Assa. Awards : John Wallace's two-year-old bull, "Maple Duke," was the winner, and J. A. Chapman's "Lord Ingleside," by Mark Hanna, second. The yearling class furnished the sweepstakes bull in Wallace's "Buller," of his own breeding, sired by Dominion Hero, out of Milkmaid, certainly the best Hereford bull that has been shown at the Industrial—well developed with table back, grand spring of ribs, full flanks, deep, thickly-fleshed quarters, bulging neck veins and good head. He is, indeed, a credit to his breed. J. E. Maple's entry, "Daymoor of Ingleside," sired by Mark Hanna, and bred by H. D. Smith, of Compton, Que., shown without any extra fitting, was second.

A good straight lot of five calves lined up before the judge, for first honors, "Marple's Perfection" being selected. He is a smooth, good topped calf. Second and third went to the Cartwright entries, "Drewry and Waldie."

In aged cows there were seven entries, and a good, useful lot were exhibited. J. A. Chapman's "Fairy 5th" was first. John Wallace's "Lady Belle 4th" was second, and W. Purdy's "Empress of Beresford" was third.

In three year olds, J. A. Chapman won with "Victoria," John Wallace's "Daisy" won second, and Marple's "Valentine" won third place.

In two year olds, J. A. Chapman won out on Downton Ingleside. Marple's entries, "Prairie Queen" and "Spot," both of high quality, were placed second and third, respectively.

In yearlings there were five to pick from—"Kate," from the Cartwright string, a thick-fleshed, wide-topped, straight-lined heifer, was given the red; second and third going to the "Poplar Grove" entries, "Gipsy Maid" and "Lady Bertha," a pair of stylish, smoothly-fitted heifers.

In heifer calves, J. E. Marples scored first on "Gem," second on "Sylvan," the former being a very smooth, well put together heifer ; John Wallace's "Johnny Lind" was third.

Two calves under a year, bred by exhibitor, was won by J. E. Marples.

John Wallace won the young herd prize. The trio of females, the get of one bull, and also in the open herd the wonderful excellence of his sweepstakes bull, and the evenness of his females winning for him over Chapman's very creditable herd in the latter section.

NOVA SCOTIA PROVINCIAL EXHIBITION, 1901.

In winners, Herefords, were exhibited by W. W. Black, Amherst, N.S.; Davidson Bros., Anagance, N.B., and A. S. Fillmore, Southampton, N.S. There was a good exhibit notwithstanding the better portion of Mr. Black's herd was not there, as they had been sent to the Toronto and Buffalo shows. Messrs. Davidson Bros. are new exhibitors, but they won several prizes. Mr. Black exhibited fourteen head, headed by aged bull,

"Captain." He was first in the aged bulls. In yearling bulls, Mr. Black won first with "Cassio of Ingleside," and also the diploma. In the section for bull calves under one year Black's "Fairplay," a neat, typical bull, was first, and Messrs. Davidson Bros.' second. In the aged cows Messrs. Davidson Bros. won with "Lady Parmelia." W. W. Black was second and third with "Beverly" and "Lillian," respectively. In the three year olds W. W. Black's "Gratia" carried off the honors. Mr. Black was also first for both aged herd and breeders' young herd. Messrs. Davidson Bros. showed a good lot, seven head in all, their aged bull, Lord Ingleside 2nd, winning second place. Two grand young bull calves, under six months, won first and second places. These same exhibitors were successful in winning first on their yearling heifer, "Hannah Inah," also second on their aged herd. A. S. Phillmore was also an exhibitor in this class and was successful in winning a few prizes.

HACKNEY HORSE SOCIETY.

ANNUAL MEETING.

The following are the minutes of the Tenth Annual Meeting of the Hackney Horse Society, held in the Albion Hotel, Toronto, February 3rd, 1902, 2 p.m.

Dr. Andrew Smith presided, in the absence of President Miller.

The minutes of the last annual meeting were read and adopted.

The Chairman said that he believed the Hackney Society was progressing favorably, just as favorably as could be anticipated ; the demand for Hackneys was increasing both in Canada and the United States, and anyone who had visited exhibitions here and in the west had seen a very high standard of animals exhibited.

The Secretary-Treasurer's report, as given below, was adopted without any action being taken in regard to reducing the membership fee.

SECRETARY-TREASURER'S REPORT.

I beg leave to present the tenth annual report of this society, showing the business done for the year ending December 31st, 1901.

Registrations. We have recorded 46 pedigrees during the year, fourteen more than last year, in fact, more than in any one year since the formation of the society. We have now about 350 pedigrees on hand, quite enough for a small volume. Should like to get authority to print it this season.

Members. Our roll has also increased slightly this year, from nineteen to twenty-one, showing that this society is progressing along with others. The matter of reducing the fees from $5.00 to $2.00 per annum might be discussed. We would not have so much to give in prizes, but would likely have a greater number of members.

Premiums. We have only paid out seventy-five dollars this last year. We might be more liberal this season. Fifty dollars was paid to the Horse Show and twenty-five to the Industrial. The show of Hackneys this year was fairly good at our Canadian exhibitions. The best mark, however, was made by Mr. Robert Beith, M.P., who, with his latest stallion Robin Adair, won second at the Pan-American and Sweepstakes at the New York Horse Show. A list of prizes will be prepared for the Government report.

At the last annual meeting a great deal was said about amalgamating with the American Association. Your Secretary has heard nothing further, and has pushed the affairs of the society with good results.

Re Lien Act. The Secretary read the Lien Act that was at present in force in Manitoba to protect stallion owners.

Mr. Jas. Turner stated that this Act had worked satisfactorily up in Manitoba, and was a great protection to the owners of stallions.

Mr. Crossley thought it would be sufficient at first to have the lien made on the colt, and if that did not work to have it extended.

The majority of the members were in favor of having the lien on both mare and foal, and the following resolution was adopted:

Moved by E. C. Attrill, seconded by H. N. Crossley, "That we recommend to the Provincial Minister of Agriculture that the lien be affixed to both the mare and foal." Carried.

Prizes. On motion of Geo. Pepper, seconded by H. N. Crossley, it was resolved, "That the Hackney Horse Society donate $50 to the Toronto Industrial Exhibition Association, and $50 to the Spring Horse Show, to be given in prizes for Hackneys as the directors of these two Associations see fit."

Herd Book. The matter of printing a Herd Book this year was brought up, but it was thought by those present it would be better to defer printing it for another year.

Medals. Moved by Geo. Pepper, seconded by E. C. Attrill, "That the Secretary be instructed to apply to the Hackney Horse Society of England for silver medals, and that they be handed over to the Horse Show Committee with instructions to follow out the conditions as laid down in the circular sent out by the Society." Carried.

FINANCIAL STATEMENT FOR THE YEAR ENDING DECEMBER 31ST, 1901.

RECEIPTS.		EXPENDITURES.	
Balance from last year	$208 84	Prizes..	$ 75 00
Cash, 21 members at $5	105 00	Stationery and postage..	12 70
Registration fees on 46 pedigrees	93 00	Auditor and stenographer	3 00
		Commission on 46 pedigrees ..	16 10
		Balance, cash on hand	300 04
	$406 84		$406 84

I hereby certify that I have examined the books and accounts of the Canadian Hackney Horse Society and the above statement is correct and in accordance therewith.

CHAS. F. COMPLIN, Auditor.
H. WADE Secretary-Treasurer.

Toronto, January 20th, 1902.

OFFICERS FOR 1902.

President.....THOS. C. GRAHAM, Claremont.
1st Vice-President.....JOHN McDONALD, Toronto.
2nd Vice-President.....E. C. ATTRILL, Goderich.

Vice Presidents for the Provinces.

Ontario.....ROBERT DAVIES.....Toronto.
Quebec.....JAS A. COCHRANE.....Hillhurst, Que.
Alberta.....A M. RAWLINSON.....Calgary, Alta.
Manitoba.....M. McMILLAN.....Brandon, Man.
New Brunswick.....J. R. FRINK.....St. John, N.B.

Directors.

H. N. Crossley, Rosseau; Robert Beith, M.P., Bowmanville; E. C. H. Tisdale, Beaverton; William Graham, Claremont; Dr. Smith, Toronto; Robert Bond, Toronto; Geo. Pepper, Toronto; Robert Miller, Stouffville; D. B. Simpson, Bowmanville.

Delegates to Industrial : H. Wade, Toronto and Geo. Pepper, Toronto.

Delegates to Western Fair : Adam Beck, London, and E. C. Attrill, Goderich.

Delegate to Ottawa : Robert Beith, M.P., Bowmanville.

Delegate to Montreal Spring Horse Show : Robert Ness, Howick, Que.

Delegates to Woodbridge Fair : John McDonald, Toronto; John Holderness, Toronto, and Robert Bond, Toronto.

Delegates to Horse Breeders' Association : John McDonald, Toronto, and Robert Beith, M.P., Bowmanville.

Auditor : F. C. Complin, London.

Secretary-Treasurer : H. Wade, Toronto.

Judges recommended for Spring Horse Show and other Exhibitions : Alex. Mair, Indian Neck, Staten Island, N.Y.; William West, Burlington, Vt.; Hon. Henry Fairfax, Aldie, Va.; Alex. Galbraith, Janesville, Wis.; Richard Gibson, Delaware.

LIST OF MEMBERS.

Attrill, E. C., Goderich.
Beith, Robert, M.P., Bowmanville.
Bond, Robert, Toronto.
Cochrane, Lew M., Crawfordville, Ind., U.S.
Crossley, H. N., Rosseau.
Davies, Robert, Toronto.
Graham, Robert, Claremont.
Graham, T. E., "
Graham, William, "
Edwards & Co., W. C., Rockland.
Hodgkinson & Tisdale, Beaverton.
Hodson, F. W., Ottawa.
Miller, Robert, Stouffville, Ont.
McDonald, John, Toronto.
Oille, J. L., V. S., Toronto.
Pepper, Geo., Toronto.
Simpson, D. B., Bowmanville.
Smith, Dr. And., Toronto.
Sorby, D. & O., Guelph.
Rawlinson, A. M., Calgary, Alta.
Robinson, N. M., Toronto.
Richardson, F., Columbus.

PRIZE WINNING HACKNEYS AT THE TORONTO INDUSTRIAL EXHIBITION, 1901.

Stallion, 4 years old and upwards.

1st. Bell Boy—108—282; chestnut, faint star, near hind leg white; foaled in 1895. Bred by Dr. W Seward Webb, Shelburne, Vt.; sire, Courier (imp.)—26—3 (1751); dam, Belle Lyons (imp.)—131—1890 (1015). Exhibitor, Dr. J. Watson, Howick, Que.

2nd. Woodlands Performer—68—; chestnut, white snip on face, hind feet white, foaled June, 1896. Bred by Hon. M. H. Cochrane, Hillhurst, Que.; sire, Barthorpe Performer (imp.)—32—(5097); dam, Miss Baker (imp.)—19—575—(4371). Exhibitor, Hackney Horse Breeders' Association, Dalhi, Ont.

3rd. Squire Rickell—74—264; chestnut, star, near hind foot white, foaled in 1895. Bred by E. W. Twaddell & Sharp, Devon, Pa.; sire, Cadet (imp.)—15—107 (1251); dam, Miss Rickell (imp.)—14—237 (1284). Exhibitor, R. Beith, Bowmanville, Ont.

Stallion, 3 years old.

1st. Connaught Heir—116—; chestnut, foaled in 1898. Bred by Herbert Webster, Durham, Eng.; sire, Lambton Connaught (5251); dam, Lady Confidence (6861). Exhibitor, Bawden & McDonell, Exeter, Ont.

Stallion, 2 years old.

1st. Guelph Performer—89—; brown, star on forehead, off hind foot white, foaled May 27, 1899. Bred by exhibitor; sire, Square Shot (imp.)—27—; dam, Miss Baker (imp.)—16—(4371). Exhibitor, O. Sorby, Guelph, Ont.

Yearling Colt, entire.

1st. Lord Brilliant—129—; chestnut, foaled June 10, 1900. Bred by exhibitors; sire, Lord Roseberry—9—(1307); dam, Trinkett—60—(873). Exhibitors, Graham Bros., Claremont, Ont.

Stallion, any age.

1st. Bell Boy—108—282. Exhibitor, Dr. J. Watson, Howick, Que.

Gelding or Filly, 3 years old.

1st. Hermia—90—; bay, foaled in 1898. Bred by exhibitor; sire, Royal Standard—55—; dam, Cherry Ripe—70—. Exhibitor, R. Beith, Bowmanville, Ont.

GELDING OR FILLY, 2 YEARS OLD.

1st. Titania—108—; chestnut, 3 white feet, foaled May 10, 1899. Bred by exhibitor ; sire, Squire Rickell —74—; dam, Mona's Queen—4—. Exhibitor, R. Beith, Bowmanville, Ont.

YEARLING GELDING OR FILLY.

1st. Princess Feodora—142—; bay, foaled July 9, 1900. Bred by exhibitor ; sire, Squire Rickell—74—; dam, Florence (imp.)—3—354—. Exhibitor, R. Beith, Bowmanville, Ont.

BROOD MARE WITH FOAL OF THE SAME BREED BY HER SIDE.

1st. Miss Baker (imp.)—16—(4371) ; brown, white feet, foaled in 1889. Bred by Jas. Case, Cockthorpe, Wells, Norfolk, Eng.; sire, Ruby (1342) ; dam, Betsy Baker (1441). Exhibitor, O. Sorby, Guelph, Ont.
2nd. Mona's Queen—4—; chestnut, foaled in 1889. Bred by Wm. Martin, Yorkshire, Eng ; sire, Lord Derwent 2nd (1034) ; dam, Mayflower—2—. Exhibitor, R. Beith, Bowmanville, Ont.
3rd. Wild Mint (imp)—106—397 (399); dark bay, star on off fore foot, and hind feet white, foaled in 1887. Bred by A. Kirby, Market Weighton, Yorkshire, Eng ; sire, Confidence (158) ; dam, Wild Rose (524). Exhibitor, R. Beith, Bowmanville, Ont.

FOAL OF 1901.

1st. Lady Peveril—147—; chestnut, off hind and off fore foot white, foaled May 18, 1901. Bred by exhibitor ; sire, Squire Rickell—74—; dam, Mona's Queen—4—. Exhibitor, R. Beith, Bowmanville, Ont.
2nd. Storm King—127—; brown, star and snipe, off fore and hind legs white, foaled June, 1901. Bred by exhibitors ; sire, Lord Roseberry—9—(1307) ; dam, Trinket—60—(873). Exhibitors, Graham Bros., Claremont, Ont.
3rd. Jubilee Performer—121—; black, little white on heel of off fore foot, near hind foot white to ankle, foaled June 15, 1901. Bred by exhibitor ; sire, Jubilee Chief (imp.)—1—108 (2122) ; dam, Miss Baker (imp.)—16—(4371). Exhibitor, O. Sorby, Guelph, Ont.

[SINGLE HORSE, MARE OR GELDING, NOT MORE THAN 15¾ HANDS.

1st. Rosseau Jewel—79—; brown roan, white star on forehead, foaled May 18, 1897. Bred by H. N. Crossley, Rosseau, Ont.; sire, Rosseau Performer—34—; dam, Surefoot—4—F.S. Exhibitor, G. A. Stimson, Toronto.

MARE, ANY AGE.

1st. Miss Baker (imp.)—16—(4371). Exhibitor, O. Sorby, Guelph, Ont.

SPECIALS FOR HACKNEYS.

Best mare or filly, registered in the English Hackney Stud Book, or entered for the subsequent volume.
1st. Mona's Queen (imp.)—4—. Exhibitor, R. Beith, Bowmanville, Ont.

Best stallion, or entire colt, registered in the English Hackney Stud Book, or entered for the subsequent volume.
1st. Connaught Heir—116—. Exhibitors, Bowden & McDonell, Exeter, Ont.

CLYDESDALE HORSE BREEDERS' ASSOCIATION.

ANNUAL MEETING.

The sixteenth annual meeting of this Association was held in the Albion Hotel on February 4th, 1902, at 7.30 p.m., President Peter Christie in the chair.

Moved by Thomas Graham, seconded by John A. Turner, "That the minutes of the last meeting be taken as read."

PRESIDENT'S ADDRESS.

By Peter Christie, Manchester, Ont.

Whilst the year 1901, now passed, has not been as excitable a one for those interested in Clydes, still the marks of progress, steadiness, pluck and victory have been most noticeable. Considering the soundness of the trade in Clydes and the increasing demands that only the best stallions be used, it is to be wondered that so few importations have been made, less in 1901 than 1900. However, it is to be hoped that quality rather than quantity shall guide the importations of the future. Two great shows were held last year in the United States, viz., the Pan-American at Buffalo and the great Exposition at Chicago, the greatest of its kind in the world, and it would be a great oversight here not to notice the victories won by the Graham Bros. with Burnbrae at Buffalo and Royal Cairnton at Chicago.

Last year Mr. George Moore was congratulated on every hand for his magnificent victory at Chicago over all breeds with his Canadian Clydes, and at the show of December, 1901, at the same place, every one was forced to admit that no other breed came near the Clydes, although money had been lavishly spent upon mating and handling some of the other breeds. It was an object lesson not soon to be forgotten.

What about the future? This is, I think, assured for some years to come; and so long as farmers and breeders of Clydesdales are as conservative as they have been for the last few years, there need be no fear of the numbers increasing faster than the demand, and neither should the fair prices of to-day fall in the least; but for Clydes of good size and quality, prices should now advance.

There are some matters which should be referred to at our annual meeting, and one is that our Executive should meet some time before the annual meeting for the purpose of attending to any detail work as well as looking over the situation generally. This has been a dead letter for the last several years. There have been some difficulties with those interested in Clydes in the outlying Provinces, and the railway authorities over registration. These matters have been laid before the Ministers of Agriculture, both for the Dominion and the Province, and it is to be hoped that nothing may have happened which will, in any way, retard our trade with these Provinces, especially as the efforts of those interested in stock are now bearing fruit in the way of advantages in railway shipping.

There are two other questions of considerable importance to us as a Clydesdale Horse Association which may be mentioned here and more fully discussed later on, viz., 1st, Shall we unite with the American Association? and, 2nd, Is the Spring Show of any advantage to Clydesdale men and breeders?

REPOPRT OF THE SECRETARY-TREASURER.

This Association, like others, has progressed very favorably during the last year. A great many Clydesdales have been imported and more sales made than in former years.

Registrations. We have recorded 562 pedigrees during the last year, 226 more than in 1900. A great many of those have been sold to go to the Northwest, a few to the United States, and still more in our own Central Provinces.

Stud Book. The XI. Volume is all printed but the indexes, and will be sent to members very shortly; it has 472 pedigrees of mares and 400 of stallions, about the same number as in Volume X. It will contain the minutes of the meetings of the Association, and the list of prizes awarded at the Industrial and Pan-American Exhibitions and the Canadian Horse Show.

Exhibitions. Clydesdales were well brought out at the Spring Horse Show, Industrial Exhibition, Western Fair, Pan-American, and at the Chicago International Shows. There were more exhibits and more exhibitors than had been out for several years. A full list of the awards will appear in the Government report.

Four handsome silver cups were awarded, one at Calgary, one at Winnipeg, one at Brandon and one at Halifax. The cups gave great satisfaction.

Financial Statement for the Year Ending December 31st, 1901.

Receipts.		Expenditures.	
Balance brought from 1900 ..	$239 99	Insurance on books....	$ 11 38
185 members, at $2..	370 00	Printing and stationery	30 00
Registration fees, 562 pedigrees, 93 transfers..	756 00	Postage, telegrams	32 00
		Stenographer and auditor.....	6 00
		Cups for prizes	88 00
		Printing Vol XI., on account ..	100 00
		Commission, 562 pedigrees, at 35c, $196.70 ; 93 transfers at 15c, $13.95..	210 65
		Balance on hand	887 96
	$1,365 99		$1,365 99

I hereby certify that I have examined the books and accounts of the Clydesdale Horse Breeders' Association, and the following statement is correct and in accordance therewith.

Toronto, Ont., January 18th, 1902.

Chas. F Complin, Auditor.

OFFICERS FOR 1902.

President—David McCrae, Guelph.

First Vice-President—Jas. Dalgety, London.

Vice-President for Ontario—O. Sorby, Guelph.

Vice-President for Quebec—Robert Ness, Howick, Que.

Vice-President for Manitoba—J. E. Smith, Brandon, Man.

Vice-Presidents for the Northwest Territories—J. A. Turner, Calgary, Alta., and A. Mutch, Lumsden, Assa.

Directors—Thos. Graham, Claremont; Robert Beith, M.P., Bowmanville; Peter Christie, Manchester; John Bright, Myrtle; John Vipond, Brooklin; Robert Miller, Stouffville; William Smith, Columbus.

Delegates to the Industrial Exhibition—Robert Beith, M.P., Bowmanville; William Smith, Columbus.

Delegates to Ottawa Exhibition—Peter Christie, Manchester, and David McCrae, Guelph.

Delegates to Western Fair—Alex. Innes, Clinton, and Jas. Henderson, Belton.

Delegates to Quebec and Sherbrooke—R. Ness, Howick, Que., and Geo. Stewart, Howick, Quebec.

Delegates to Horse Breeders' Association—Jas. Dalgety, London, and Thomas Graham, Claremont.

Judges suggested to select from—Jas. Henderson, Belton; A. McLaren, Aurora, Ill., U.S.; A. Galbraith, Janesville, Wis.; Robert Beith, M.P., Bowmanville; John Davidson, Ashburn; J. H. Kimball, Montreal; Jas. Lowery, Montreal; Geo. Moore, Waterloo.

Secretary-Treasurer—H. Wade, Toronto.

LIST OF MEMBERS.

Armstrong, Geo., Speedside.
August, E. A., Bates, Man.
Bawden & McDonell, Exeter.
Beatty, William, Thornhill.
Beith, Robert, M.P., Bowmanville.
Bennett, D., Dutton.
Bennie, G. & W., Castleavery, Man.
Bessner, Eug., South Vancouver, B.C.
Beswetherick, Wm., Hagersville.
Black, J. I., Morewood.
Black, W. W., Amherst, N. S.
Birrell, D., Greenwood.
Bone, A., L'Amaroux.
Bostwick, Alf., Oak Ridge.
Boyyer, Frank, Charlottetown, P.E.I.
Brady, Thos., Chatham.
Bright, John, Myrtle.
Brodie, D. C., Burwell Road.
Burnett, W. R., Markdale.
Butler & Son., Wm., Ingersoll.
Calder, Chas., Brooklin.
Cairns, Thos., Dublin.
Carstairs, David, Bomanton.
Cargill & Son., H., Cargill.
Chadbourne, John, Ralphton, Man.
Charlton, E. & W., Duncrief.
Chapman, Bros., Kirby.
Christie, Peter, Manchester.
Clark, J. G., Ottawa.
Cordiner, John, Ennotville.
Courcey, Bros., Lucan.
Cowan, W. I., Cannington.
Cowie, John W., Markham.
Crossley, H. N., Rosseau.
Dalgety, Bros., London.
Davidson, John, Ashburn.
Davidson, Geo., Cherrywood.
Davidson & Son, Jas. I., Balsam.
Davenport, T. A., Cornelia, Ia., U.S.A.
Davidson & Son, Peter, Fergus.
Davies, Geo. I., Toronto.
Davies, Robert, Toronto.
Davy, W. J., Whitby.
Devitt, S. A., Cadmus.
Devitt & Son, Isaac, Freeman.
Dickson & Bro., J. W., Attwood.
Doherty, Alex., Ellesmere.
Donaldson, A., Fort Qu'Appelle, Assa.
Duff, Robert, Myrtle.
Dybert, R. F., Springville, N.Y., U.S.A.
Dyment, N., Barrie.
Edwards & Co., W. C., Rockland.
Edmonds, L. H., Blenheim.
Elder, Tully, Brandon, Man.
Evans, R., Youngsville.
Filey, C., Stratford.
Forgie, John, Claremont.
Foster & Son, Wm., Humber.
Found, Jas., Dunbarton.
Frayn, Wm., Springbank, Alta.
Gardhouse, J. Mart., Highfield.
Gardner, Wm., Ashburn.
Good, Thos., Richmond.
Gormley, A. G., Unionville.
Graham, Robert, Claremont.
Graham, T. E., Claremont.
Graham, W. M., Claremont.
Gray, Geo., Newcastle.
Gray, John, Atwood.
Grier, Jas., Ormstown, Que.
Groat, Chas., Brooklin.
Guild, Wm., Kemnay, Man.
Hallman, Josiah, Washington.
Hamilton, Wm., Coalfields, Assa.
Hay, Geo., Lachute, Que.
Hemmingway, M. R., Unionville.
Henderson, Jas., Belton.
Hendrie, Wm., Jr., Hamilton.
Hepburn, Wm., Foley.
Herold, P., V.S., Tavistock.
Hodgkinson & Tisdale, Beaverton.
Hodson, F. W., Ottawa.
Hogate, A. R., Toronto.
Hooey, John, Cadmus.
Hosken, A. E., Cobourg.

LIST OF MEMBERS—*Concluded.*

Howden & Son, J. D., Whitby.
Howard, W. J., Dollar.
Hummerson, Ira, Youngsville.
Hyder, Peter, Oxford Centre.
Isaac, John, Markham.
Ireson, C. E., Toronto.
Jackson & Son, Geo., Downsview.
Judd, Herbert, Brandon, Man.
Kirton, John, Wick.
Laing, Thos., Eburne, B.C.
Langdon, Henry, Hazeldean.
Lane, Henry, Columbus.
Laviollette, Jos., Jr., Virginia.
Legge, T. H., Temperanceville.
Leonard, Jas., Schomberg.
Lingelback, Wm., Cassel.
Linton Wm., Claremont.
Little, David, Portage la Prairie, Man.
Little, S. G., Hagerman.
Lougheed, H., Heathcote.
Lyle, Samuel, Wawanesa, Man.
Madill, E., Streetsville.
Major, Bros., Whitevale.
Marsh, Uriah, Newmarket.
Marshall, Jas. I., Pine Grove.
Miller, Robert, Stouffville.
Miller, R. H., Lumsden, Assa.
Milroy, W., Toronto.
Moore, Geo., Waterloo.
Mossop, Wm., St. Mary's.
Mutch, A. & G., Lumsden, Assa.
McBeth, Donald, Oak Lake, Man.
McCaig, Alex., Aberfoyle.
McCallum, John, Dauphin, Man.
McCrae, David, Guelph.
McDonald, J. A., Qu'Appelle, Assa.
McEwen, D., Dewittville, Que.
McFarlane, J. M., Baljennie, Sask.
McGeachey, D. & R., Coleraine.
McGillivray, John A., Uxbridge.
McIntosh, Wm., Burgoyne.
McIlvroy, J. T., V.S., Elgin Mills.
McIlquhan, John, Columbus.
McLachlan, Bros., Hillsburg.
McMane, Allen, Donegal.
MacMillan, J. A. S., Brandon, Man.
McMullen, S. G., Mount Albert.
Ness, Robert, Howick, Que.
Newman, Robert, Woodford.
Noble, Francis, Wawanesa, Man.
Noble, Jas., Toronto.
Newlove, J. L., Brampton.
O'Leary, J. T., Blooming Prairie, Man.
Oliver, John, Dunerief.
O'Tool, ——, Mount Albert.
Paton, Hugh, Montreal, Que.
Peterson, A., Hawkesville.
Philip, William, Yelverton.
Pollock, R., Ravenshoe.
Pingle, Alex., Unionville.
Prouse, S. J., Ingersoll.
Richardson, Fred., Columbus.
Robertson, Thos. W., High River, Alta.
Robinson, Mrs. J. W., St. Marys.
Ross., Jas., Inverhaugh.
Russell, A. S., Carrville.
Sawdon, R., Toronto.
Scott, R. C., Galt.
Scott, John, Cromarty.
Scott & Sons, Sutton West.
Semple, H., Hereward.
Shannon Bros., Cloverdale, B.C.
Shattuck, W. D., Davisburg, Alta.
Simpson, D. B., Bowmanville.
Sims Bros., Thamesford.
Skinner, Thos., Mitchell.
Smith, A. G., Myrtle.
Smith, John E., Brandon, Man.
Smith, Walter Harland, Toronto.
Smith, Wm., Columbus.
Snell Albert, Hagersville.
Snell, Jas., Clinton.
Sorby, D. & O., Guelph.
Staples, Geo., Lifford.
Stephen, John, Anderson.
Stephens & Son, L.E., Robinson, Ill., U.S.
Stewart, G. G., Howick, Que.
Storey, Harry, Picton.
Switzer, R. C., Wetaskawin, Alta.
Taylor, Thos., Harwich.
Taylor, Jos., Elgin, Man.
Telfer, John B., Waterdown.
Thompson, J. R., Calgary, Alta.
Thompson, Purves, Pilot Mound, Man.
Thorburn, D., Davisburg, Alta.
Todd, Thos., St. Helens.
Tomlin, E., Sombra.
Toole, J. C., Mt. Albert.
Torrence, Jas., Markham.
Trick, Richard, Unionville.
Turner, John A., Calgary, Alta.
Turner, Robert, Millarville, Alta.
Vanhorne, Sir Wm. C., Montreal, Que.
Vipond, John, Brooklin.
Walker, T., Toronto.
Watt, J. & W. B., Salem.
White, Job., Ashburn.
Willis, Richard, Pine Grove.
Wilkie, William, Toronto.
Wishart, Jno., Portage la Prairie, Man.
Witherspoon, A. J., Humber.
Wright, Bryce, De Winton, Alta.
Wright, Lewis A., Salisbury, N.B.
Yake, Danie, Kintore.
Yake, Philip, Kintore
Young, Robt., Galt.

PRIZE WINNING CLYDESDALES AT THE TORONTO INDUSTRIAL EXHIBITION, 1901.

Stallion and four of his progeny, not over two years old.

1st. Macqueen (imp.) [462] 3513 (5200), bay, hind legs white, foaled May 15, 1885. Bred by P. Kerr, Scotland; sire, Macgregor (1487); dam, Bet of Bellamack (5506). Exhibitors, Graham Bros., Claremont, Ont.
2nd. Lord Charming [2264], bay, three white legs; foaled May 29, 1893. Bred by R. Holloway, Alexis, Ill.; sire, Prince Charming [2263]; dam, St. Cuthbert's Lady [2303]. Exhibitor, O. Sorby, Guelph, Ont.

Stallion, four years old and upwards.

1st. Cloth of Gold [2959], light bay, foaled May 29, 1893. Bred by R. Holloway, Alexis, Ill.; sire, Lord Charming [2264] 7564; dam, Madge 3rd [2938] 4096. Exhibitor, O. Sorby, Guelph, Ont.
2nd. Bumbrae [2707] 8378, bay, stripe in face, four white legs, foaled May 17th, 1895. Bred by N. P. Clarke, St. Cloud, Minn; sire, Rosewood (imp.) [2708] 6775 (7207); dam, Young Bloom (imp.) [2407] 7554. Exhibitors, Graham Bros., Claremont, Ont.
3rd. Merchiston (imp.) [2833] (10236), bay, narrow stripe in face, hind feet white, foaled May 24, 1894. Bred by H. B. Howick, Hazelrigg, Belford, Scot.; sire, Prince Alexander (8899); dam, Lothian Lass (12188). Exhibitor, R. Ness, Howick, Que.
4th. Balmedie Marquis [2942] (10495), bay, stripe, near fore and both hind feet white, foaled March 5, 1897. Bred by W. H. Lumsden, Balmedie, Scot; sire, Royalist (6242); dam, My Lady (12542). Exhibitors, Innes & Hill, Sonya, Ont.

Stallion, three years old.

1st. Royal Cairnton (imp.) [2730], bay, hind feet white, foaled June, 1898. Bred by R. Turner, Scotland; sire, Royal Standard (9847); dam, May Montrose (13646). Exhibitors, Graham Bros., Claremont, Ont.
2nd. Lyon Stewart [2732], bay, stripe on face, white rings on fore fetlocks, hind feet white, foaled June 7, 1888. Bred by Jas. Stewart, Springbank, Ont.; sire, Lassodie Rover (imp.) [2725] (9779); dam, Houstin Lassie (imp.) [679]. Exhibitor, H. G. Boag, Churchill, Ont.
3rd. Copyright (imp.) [2739] (10724), brown, white face and hind legs, foaled May 16, 1898. Bred by A. Mitchell, Barcheskie, Scot.; sire, Baron's Pride (9122); dam, Trilby of Barcheskie (12582). Exhibitor, R. Ness, Howick, Que.
4th. Moncrieffe (imp.) [2798] (11116), dark brown, stripe in face, four white legs, foaled, May 26, 1898. Bred by Peter Aitkin, Balgreggan, Scot.; sire, Moncrieffe Marquis (9953); dam, Bess of Balgreggan (10020). Exhibitor, T. H. Hassard, Millbrook, Ont.

Stallion, two years old.

1st. Premier Prince [3193], bay, three white feet, foaled July 28, 1899. Bred by R. B. Ogilvie, Madison, Wis.; sire, Handsome Prince [3192] 5581; dam, Moss Rose 2nd [2791] Exhibitors, Graham Bros., Claremont, Ont
2nd. Laurentian [2954], bay, stripe, off hind leg white, foaled May 26, 1899. Bred by exhibitor; sire, Lawrence Again (imp.) [2047] (7909); dam, Roseleaf (imp.) [2465]. Exhibitor, R. Ness, Howick, Que.
3rd. Jock McCull [2752], bay, white face, hind legs white nearly to hocks, foaled May 2, 1899. Bred by N. Robinson, Jarvis, Ont.; sire, Brougham (imp.) [2525] 6749 (9147); dam, Bonnie Lass [2819]. Exhibitors, Eaid & Everett, Simcoe, Ont.
4th. Dunrobin [2767], dark bay, stripe in face, four white legs, foaled June 24, 1899. Bred by Uriah Marsh, Newmarket, Ont.; sire, Vanguard (imp.) [157] (4092); dam, Newmarket Jessie [2836]. Exhibitor, B. H. Millard, Orillia, Ont.

Yearling Colt, Entire.

1st. Bold Boy's Heir [3052], bright bay, white face, hind legs and right front foot white, foaled May 8, 1900. Bred by Walter Murray, Avonton, Ont; sire, Bold Boy (imp.) [1149] (4257); dam, Miss Russell [3101] Exhibitor, Jos. Whelihan, St. Mary's, Ont.
2nd. Macqueen's Model [2750], bay, stripe in face, hind legs white, foaled June 6, 1900. Bred by Wm. Major, Whitevale, Ont.; sire, Macqueen (imp.) [462]; dam, Darling (imp.) [2811]. Exhibitor, J. W. Cowie, Markham, Ont.
3rd. Bold Boy 2nd [3030], bright bay, white face, near fore and both hind feet white, foaled May 15, 1900. Bred by Geo. Rundle, Science Hill, Ont.; sire, Bold Boy (imp.) [1149] (4257); dam, Lady Russell [3084]. Exhibitor, Jos. Whelihan, St. Mary's, Ont.

Stallion, any age.

1st. Royal Cairnton (imp.) [2730]. Exhibitors, Graham Bros., Claremont, Ont.

FILLY, THREE YEARS OLD.

1st. Cherry Startle [2788], brown, star in forehead, snip on nose, little white on fore pasterns, hind pasterns white, foaled April 16, 1898. Bred by R. Holloway, Alexis, Ill.; sire, Startle [2726] 6127; dam, Cherry Sweet [2787] 4092. Exhibitors, Graham Bros., Claremont, Ont.
2nd. Charming Lady [2790] 8966, bay, stripe in face, white legs, foaled October, 1899. Bred by R. Holloway, Alexis, Ill.; sire, Prince Charming [2263] 5647; dam, St. Cuthbert's Lady [2303] 3426. Exhibitor, Graham Bros., Claremont, Ont.
3rd. Princess of Elm Park [2602] bright bay, stripe in face, little white on hind feet, foaled May 15, 1898. Bred by Jas. Hunter, Alma, Ont.; sire, Macclinker (imp.) [2223] 6762; dam, Queen of Sunnyside [2598] 7348. Exhibitor, Jas. Bowman, Guelph, Ont.

FILLY, TWO YEARS OLD.

1st. Bold Jean [3037], bright bay, white face, near fore and both hind feet white, foaled May 2, 1899. Bred by exhibitor; sire, Bold Boy (imp.) [1147] (4257); dam, Lady Jordanshaw [1820]. Exhibitor, Wm. Rae, St. Paul's, Ont.
2nd. Look-Me-Over [3062], light bay, stripe on face, three white legs, foaled April 27, 1899 Bred by exhibitor; sire, Lawrence Again (imp.) [2047]; dam, Nettie of Howick [3060]. Exhibitor, R. Ness, Howick, Que.
3rd. Silver Belle [3076], bay, stripe in face, foaled June 2, 1899. Bred by Heron Bros., Ashburn, Ont.; sire, Two In One [2383]; dam, Lady Aberdeen [2928]. Exhibitors, Graham Bros., Claremont, Ont.

YEARLING FILLEY OR GELDING.

1st. Royal Queen [2802], bright bay, stripe in face, foaled May 23, 1900. Bred by exhibitors; sire, Macqueen (imp.) [462] (5200); dam, Royal Princess [2345]. Exhibitors, Hodgkinson & Tisdale, Beaverton, Ont.
2nd. Charming Sunflower [3054], bay, stripe in face, little white on fore legs, hind legs white to hock, foaled June 3, 1900. Bred by exhibitor; sire, Lord Charming [2264] 7564: dam, Sunlight [2279] 8303. Exhibitor, Jno. Savage, Gourock, Ont.
3rd. Look Again [3061], bay, stripe, hind legs white, foaled May 23, 1900. Bred by exhibitor; sire, Plough Boy (imp.) [2369]; dam, Netty of Howick [3060]. Exhibitor, R. Ness, Howick, Que.

BROOD MARE WITH FOAL OF THE SAME BREED BY HER SIDE.

1st. Nellie Rosewood; sire, Lord Wellington (imp.) [2961] 9977 (6981); dam, Darling (imp.) [2811]. Exhibitor, J. W. Cowie, Markham, Ont.
2nd. Cherry Sweet [2787] 4092, bay stripe in face, hind feet white, foaled May 30, 1888. Bred by R. Holloway, Alexis, Ill.; sire, Cedric (imp.) [2262] 929 (1087); dam, Cherry Ripe (imp.) [2305]. Exhibitors, Graham Bros., Claremont, Ont.
3rd. Miss Stanley [2307] 5877, bay, white face, hind legs white, foaled April 17, 1890. Bred by N. P. Clarke, St. Cloud, Minn.; sire, Stanley Prince (imp.) [2265] 3971 (6315); dam, Lillie Macgregor (imp.) [2306] 3957. Exhibitor, O. Sorby, Guelph, Ont.

FOAL OF 1901.

1st. Macqueen Best [3844] bay, stripe on face, white legs, foaled March 28, 1901. Bred by exhibitors; sire, Macqueen (imp.) [462]; dam, Countess of Derby [1954]. Exhibitors, Graham Bros., Claremont, Ont.
2nd. Alexander Macqueen. Exhibitor, J. W. Cowie, Markham, Ont.
3rd. Lily Charming [3056] bay, stripe on face, hind legs white to hocks, foaled April 16, 1901. Bred by exhibitor; sire, Lord Charming [2264]; dam, Miss Stanley [2307]. Exhibitor, O. Sorby, Guelph, Ont.

MARE WITH TWO OF HER PROGENY.

1st. Cherry Sweet [2787] bay, stripe in face, hind feet white. foaled May 30, 1888. Bred by R. Holloway, Alexia, Ill.; sire, Cedric [2262]; dam, Cherry Ripe [2305]. Exhibitors, Graham Bros., Claremont, Ont.

MARE, OF ANY AGE.

1st. Cherry Startle [2788]. Exhibitors, Graham Bros., Claremont, Ont.

THE CANADIAN HORSE SHOW, TORONTO, 1901.

Judges—Alex. Galbraith, Janesville, Wis.; Jas. Henderson, Belton; Geo. Cockburn, Baltimore.

CLYDESDALE STALLION, FOALED PREVIOUS TO JAN. 1ST, 1898.

SIX ENTRIES.

First Prize, $50.—King of the Clydes (imp.) [2569] bay, four white fetlocks, foaled April 27th, 1897. Sire, Ringleader (10427); dam, Jess (11346). Exhibitor, J. M. Gardhouse, Highfield, Ont. Breeder, representatives of late Alex. Gibson, Brechin, Scotland.

Second Prize, $30.—Cloth of Gold [2946] 8962, chestnut, foaled March 31st, 1877. Sire, Lord Charming, [2264] 7564 ; dam, Madge 3rd 4096. Exhibitor, O. Sorby, Guelph, Ont. Breeder. R. Holloway, Alexis, Ill

Third Prize, $20 —Harmony (imp.) [2951] (10772) bay, 3 white legs, foaled in 1900. Sire, Prince of Carnichan (8151) ; dam, Melody (12837). Exhibitor, Robt. Graham, Ringwood, Ont. Breeder, W, McConnell, Kirkcowan, Scot.

Fourth Prize, Reserve,—Grandeur 2nd [2246] bay, white face, off hind foot white, foaled May 3rd, 1894. Sire, Grandeur (imp.) [1724] ; dam, Bell (imp.) [1755]. Exhibitor, I. Devitt & Sons, Freeman, Ont. Breeder, I. Devitt & Sons, Freeman, Ont.

Clydesdale Stallions, foaled in 1898.

Eight Entries.

First Prize, $35.—Copyright (imp.) [2739] (10724), brown, hind legs white, foaled May 16, 1898. Sire, Baron's Pride (9122) ; dam, Trilby of Barcheskie (12582). Exhibitor, Robt. Ness, Howick, Que. Breeder, A. Mitchell, Barcheskie, Scot.

Second Prize, $25.—Lyon Stewart [2732] bay, hind feet white, foaled June 7, 1898. Sire, Lassodie Rover (imp) [2725] (9779) ; dam, Houston Lassie (imp.) [679] Exhibitor, H. G. Boag, Churchill, Ont. Breeder, Jno. Stewart, Springbank, Ont.

Third Prize, $15.—Sir Redvers (imp.) [2950] (10928) brown, foaled May 8, 1898. Sire, Knight of Cowal (10074) ; dam, Garnet (8675). Exhibitor, Robt. Graham, Ringwood, Ont. Breeder, Marquis of Londonderry, Scaham Harbor, Eng.

Fourth Prize, Reserve.—Lipton (imp.) [2949] (10792), brown, near hind foot white, foaled May, 1898 Sire, Sir Everard (5393) ; dam, Kate of Drum (13332). Exhibitor, Bawden & McDonell, Exeter, Ont. Breeder, Wm. Young, Campbeltown, Scot.

Clydesdale Stallions foaled subsequent to and on Jan. 1st, 1899.

Three Entries.

First Prize, $25.—Bay Chief [2955] 9979, bay, hind feet white, foaled Aug. 20, 1899. Sire, Lord Wellington (6981) 9977 ; dam, Jenny [2935] 9978. Exhibitor, J. W. Cowie, Markham, Ont. Breeder, Wm. Major & Son, Whitevale, Ont

Second Prize, $15 —Laurentian [2954] bay, right hind leg white, foaled May 26, 1899. Sire, Lawrence Again (imp.) [2047] (7909). Dam, Rose leaf (imp) [2465] Exhibitor, Robt. Ness, Howick, Que. Breeder, Robt. Ness, Howick, Que.

Third Prize, $10.—Charming Lad [2923] bay, off fore foot and both hind ankles white, foaled July 1, 1899. Sire, Lord Charming [2264] 7564 ; dam, Venus [2069] Exhibitor, O. Sorby, Guelph, Ont Breeder, O. Sorby, Guelph, Ont.

Canadian Bred Clydesdale Stallions, foaled previous to Jan. 1st, 1900.

One Entry.

First Prize, $25.—Gay McGregor [2922] bay, four white feet, foaled May 29, 1899. Sire, Erskine Macgregor (imp.) [2225] (1543) ; dam, Bertie [2909]. Exhibitor, D. Carstairs, Bomanton, Ont. Breeder, D. Carstairs, Bomanton, Ont.

Canadian Mares, Imported or Canadian bred, any age.

Five Entries.

First Prize, $30.—Sonsie Lass [2313] 7660, bay, hind legs white, foaled April 8, 1893. Sire, Second Choice (imp.) [1431] (8244) 5566 ; dam, Sonsie [996] 5287. Exhibitor, O. Sorby, Guelph, Ont. Breeder, N. P. Clarke, St. Cloud, Minn.

Second Prize, $20.—Diana MacKay [2314] 6947, bay, fore legs white half way to knee, hind legs white, foaled May 11, 1892. Sire, MacKay (imp.) [2257] 4525 (5194) ; dam, Jane Eyre (imp) [217] 5278 Exhibitor, O. Sorby, Guelph, Ont. Breeder, N. P. Clarke, St. Cloud, Minn.

Third Prize, $15 —Kitty Tyrell [2934] 8226, bay, foaled July 19, 1892. Sire, Lord Lieutenant (imp) [975] 5175 (4529) ; dam, Queen of the West 8219. Exhibitor, A. G. Gormley, Unionville, Ont. Breeder, Jno. Gormley, Unionville, Ont

Fourth Prize, Reserve —Rose of Burndennet [2932] 8218, brown, foaled June 5, 1892. Sire, Lord Lieutenant (imp) [975] 5175 (4529) ; dam, Belle of Unionville 8217. Exhibitor, A. G. Gormley, Unionville, Ont. Breeder, Jno. Gormley, Unionville, Ont

Pair of Draught Mares or Geldings, any breed whatever, shown in harness.

First Prize, $40 —Sonsie Lass [2313] b. m., foaled April 8th, 1893. Diana McKay [2314] b. m , foaled May 11th, 1892. Exhibitor, O. Sorby, Guelph, Ont.

Second Prize, $20.—Kitty Tyrell [2934] b. m., foaled July 19, 1892. Meadow Lark 8222 b. m. Exhibitor, A. G. Gormley, Unionville, Ont.

Third Prize, $10 —Crown, b. g , 16 3, 4 yrs. Joe, b. g , 16.3, 4 yrs. Exhibitor, Geo. Moore, Waterloo, Ont.

Fourth Prize, Reserve.—Jack, b. g., 15, 8 yrs. Pete, b. g., 15, 8 yrs Exhibitor, Dominion Radiator Co., Toronto.

HORSE BREEDERS' LIEN ACT.

The Secretary stated that the Minister of Agriculture was now preparing a lien Act to be put through the present session, similar to the one in force in Manitoba; but as the Act in Manitoba only called for a lien on the colt he wished to get the sense of the meeting in order to ascertain if that met with their approval.

The members thought it advisable to have the lien attached to both mare and colt, and the following resolution was passed :

Moved by John A. McGillivray, seconded by William Hendrie, jr., "That the Government be asked to pass a bill that will affix a lien to the mare and colt until the stallion service is paid for." Carried.

PRIZES.

Moved by William Smith, seconded by William Hendrie, jr., "That we donate the same amount as last year for the same purpose." Carried.

Moved by Jas. Turner, seconded by Thos. Graham, "That a cup be given for the best female, any age, where cups were given for the best stallions last year." Carried.

Last year $25 was given in the form of a cup to each of the following places, for best stallion, any age; no horse to win more than one cup given by this Association · Calgary, Winnipeg, Brandon and Halifax.

NEW BUSINESS.

The question in the President's address : "Is the Spring Show of any advantage to Clydesdale men and breeders ?" brought out considerable discussion.

The President : I know a great many think the Spring Show is not what it used to be, and it is a question whether it is worth while for the Clydesdale men to continue in it or not; it is now for them to discuss whether they should be part and parcel. I know a great many have spoken to me about it, and they did not think it was of any benefit to Clydesdale men—that the Clydesdales seemed to be set to one side and shown in the morning before any person got there. I think it would be a very good question to discuss before we give a grant towards the benefit of the show.

William Hendrie : I think that that point is very well taken at this meeting. If it is the case that amongst the Clydesdale breeders due recognition of their breed has not been given a proper place at the Canadian Horse Show in this city, I think that if such an influential body as is represented here conveyed those sentiments to the Canadian Horse Show they would have it rectified. But you all know they put the attractive classes on in the evening, and to horse breeding interests, to my idea, it is not right; but unless you bring it prominently to their attention they will continue to do it. I am sorry to hear, if it is so, that the Clydesdale men do not think that the Canadian Horse Show is not of interest to these men. It would seem that it should be if their horses are put on at a time when most people can see them, because it must appeal to many that the owner of a stallion that goes away from the Canadian Horse Show with a blue ribbon must find it a certain advantage to him in making his spring season. You might say this is only a spring show, but, of course, at the Industrial in the fall the season is over. I do hope that the Canadian Clydesdale men will still continue to give it their support, and at the same time they may put a memorandum into effect that their breed must be better recognized in a better place perhaps in the programme.

Mr. Innes : I do not hardly think that is the great trouble with the breeders ; a great many think the show is held too late for them.

David McCrae: When the Horse Show was established in Toronto it was established for Clydesdale men and for two special purposes. One was to make it somewhat after the pattern of the Glasgow show—a show to bring the best horses of the country together at a time when the buyers wanted them; and the other reason was that it be held at a time that associations in the different parts of Canada would hear of these horses, if they could not get them sold. The show went on for the first or second years with scarcely anything else there. It has now grown away from the original intention and is not a horsemen's show. It is now held too late in the season, at too late a time for stallion owners to make their arrangements or sales. It is not enough, it would not be enough, to put the Clydesdale horses at some other time, which is largely a social function, and which I am very pleased to attend. At the same time, it does not suit the breeders of heavy horses, as it is too late to bring the buyers here. It is not filling the idea originally intended, as the two original objects of this show are entirely lost sight of in the present show. We must do something if we are going to advance the best interests of the Clyde horses in this country. We want to get the show at a time as will best suit the buyers, not only from the Ontario and the Northwest, but also from the other side. We want to get buyers for our stallions, and want to have these shows at time as will best suit the buyers. Now, the show is entirely too late; it has been found impossible for the Secretary to get it any earlier, and we must have something different in that way. I think about the time of the Glasgow show, in February or March, would suit the breeders.

Mr. Turner: February would suit the western buyers.

Mr. McCrae: I do not know that there is anything better than to go to Guelph. We want something done along those lines, and the present Horse Show is not and will not fill the bill.

The Secretary stated they had a little trouble in getting the show early enough. The old show used to be held some time in March, and they had a very good exhibit of Clydes when times were good; but it was very hard to pick a time to suit every buyer. He thought if they drew away from the Spring Horse Show they would not get very much help. The last two or three years they had arranged at the Spring Horse Show to have all the heavy horses exhibited on one day in order to suit the farmers as much as possible, and they had tried to do all they could to make it satisfactory to them. This year they would not have the Military Tournament in connection with the Horse Show, and he did not see any reason why they could not have it a week or two earlier.

Thos. Graham: Will not a week or two earlier conflict with the Boston Show? So far as the number of horses that are sold, there were ten or more sold then to every one now.

William Smith: There is another phase, that is, all these shows should be educative. Now, as far as I noticed, one of the great difficulties is you will scarcely find over a dozen Clydesdale farmers or breeders attending this show. I think this is to be deplored. Whilst I realize there would be great difficulties to overcome in separating from the Spring Horse Show, yet it appears to me, if we are to have our choice we should simply take our own way. I am bound to say this, that I feel the early shows were productive of much greater good to the people of Ontario generally than the last three or four. I know that in speaking to the farmers after perhaps going home from the show, they would mostly always sneer at any question you asked as to how the show came off. Now it is to be deplored. The time has come when Clydesdale men are determined to take a stand of their own. Now I think I am speaking the sentiments of a great many Clydesdale men when I say the Spring Show is not filling the bill.

Mr. Hendrie: How many entries were there in Clydes?

Mr. Wade: Not quite as many as in former years.

Mr. McGillivray: I think perhaps it would be as well to continue this year as we are doing, and then see whether our representatives to the Canadian Horse Show could not arrange to have the show earlier. You see if you cut adrift from the Canadian Horse Show you first must get a location.

Mr. Thos. Graham : We could get the Mutual Street Rink.

William Hendrie : Another question to consider is the Ontario grant. If we are going to pull away from each other it is going to be hard work to know how to distribute it.

J. M. Gardhouse : I think this is a matter of very great importance, and I think it is a matter that pertains to the whole general public. The breeders have felt this show was too late for them to exhibit their stallions. You take a man who has two or three stallions to put on the road, he gives them entirely different food to what he does when fitting them for show purposes, and as the show is held so late he cannot fit them for the show and have them go on the road at the same time, and a great many people like to be breeding their mares about the time the show is held, so for this reason he is unable to exhibit. Then again, if a persou has to ship his stallions a distance they are not in proper shape to go on the road and do good work. Farmers and breeders who would attend this show feel that it is too busy a time, and any person going to purchase a horse feels that it is too late to get him in shape for his spring work. No doubt this has been a great show, and no doubt it has done a lot of good, at the same time the breeders feel it is not doing the work it should do.

Mr. Robert Graham : I concur with the remarks of Mr. Gardhouse.

Mr. Hendrie moved that the Canadian Clydesdale Association still continue to support the Canadian Horse Breeders' Association as they had done in the past, which was seconded by Mr. John A. McGillivray, but afterwards withdrawn when the following resolution was submitted :

Moved by Mr. William Smith, seconded by Mr. David McCrae, "That the Directors be instructed to take the necessary steps to have a Spring Horse Show at such time and place as will suit the breeders and farmers of Canada." Carried.

D. McCrae : I should like to see the Executive take prompt action in the matter, and do what they can this year if possible, and next year to arrange the show at a proper time when heavy horses can be shown.

Dr. Andrew Smith said he easily saw how the breeders of heavy horses often thought that the show was too far on in the year, but he feared there would be a little difficulty in getting a place suitable to show.

Mr. Hendrie : I would not like the idea to go abroad that the Clydesdale and the Shire are going to cut loose from the Canadian Horse Breeders' Association.

J. M. Gardhouse : Would that mean to take in all the breeding classes ?

D. McCrae : I meant all the heavy classes. I certainly would not wish to antagonize the Horse Show or breeders of other breeds. As a Clyde meeting we can only legally deal with our own breed; but I should think the Directors could give the others consideration.

Mr. John A. McGillivray : If this committee cannot find ways and means to hold a show this year I trust they will go on and recognize the Canadian Horse Show. You see it is now the 5th of February, and I do not see how you can possibly institute a Clydesdale show.

Mr. D. McCrae stated they were having classes at the Agricultural School just now in judging, and they had drawn up a scale of points for Clydesdales and Shires, and thought it would be advisable to appoint a committee to revise that scale of points.

On motion it was resolved, "That the Directors be instructed to formulate a scale of points for the Clydesdale breed and have it published."

The meeting then adjourned.

DIRECTORS' MEETING.

At the conclusion of the annual meeting the Directors met for a short time and discussed the matter of holding a Spring Show. They decided not to take any action until they heard from the Horse Breeders' Association what arrangements they were going to make.

SHIRE HORSE BREEDERS' ASSOCIATION.

ANNUAL MEETING.

The thirteenth annual meeting of this Association convened at the Albion Hotel, Toronto, on February 6th, 1902, 11 a.m.

In the absence of the President, Vice-President Jas. M. Gardhouse took the chair.

Moved by John Gardhouse, seconded by Jas. Turner, "That the minutes of the last annual meeting be taken as read." Carried.

The Secretary-Treasurer's report, as given below, was then adopted.

SECRETARY-TREASURER'S REPORT.

This has been quite an important year. In the first place the first volume of the Stud Book for this Association was published and distributed amongst the members, filliug a long required want. We have also recorded 31 pedigrees during the year, against 19 in 1900—quite an increase.

We have also increased our membership roll from 10 in 1900 to 17 in 1901; this is very satisfactory. We had sufficient funds to pay for the volume and end up the year with $5.75 in the treasury.

Shires were well brought out at all the principal exhibitions, and the well-known stallion Belshazzar (imp)—236—won the first and championship at the Pan-American Exposition.

FINANCIAL STATEMENT FOR THE YEAR ENDING DECEMBER 31ST, 1901.

RECEIPTS.		EXPENDITURES.	
Balance from 1900	$121 08	Vol. I., Shire Book	$155 00
17 members, at $2	34 00	Postage, stationery and s'ndries	13 55
Registration fees	33 50	Auditor and stenographer	3 00
		Commission on 31 pedigrees, 3 transfers	11 30
		Balance on hand	5 75
	$188 58		$188 58

I hereby certify that I have examined the books and accounts of the Shire Horse Breeders' Association, and the above statement is correct and in accordance therewith.

CHAS. F. COMPLIN, Auditor.

Toronto, Ont., January 20th, 1902.

OFFICERS FOR 1902.

President ..... W. E. Wellington, Toronto.

1st Vice-President ..... Jas. M. Gardhouse, Highfield.

2nd VicePresident ..... Wm. Hendrie, Jr., Hamilton, Ont.

Directors : William Wilkie, Toronto ; H. N. Crossley, Rosseau ; Owen Geiger, Hensall, Jas. Henderson, Belton ; John Gardhouse, Highfield : Jas. Dalgety, London; W. Bawden; Exeter.

Delegates to Industrial Exhibition : H. N. Crossley and John Gardhouse.

Delegates to Western Fair : H. Wade and Jas. Dalgety.

Delegate to Central Exhibition, Ottawa : H. Wade.

Delegates to Horse Breeders' Association : H. N. Crossley and Jas. H. Gardhouse.

Judges—Recommended for Spring Horse Show and other shows :—Robert Graham, Claremont ; Jas. A. Turner, Calgary, Alta. ; Jas. Henderson, Belton ; Thos. Graham, Claremont; A. McLaren, Aurora, Ill. ; Peter McGregor, Brucefield ; John T. Gibson, Denfield.

Auditor ..... F. C. Complin, London.

Secretary-Treasurer ..... H. Wade, Toronto.

LIST OF MEMBERS.

Attrill, E. C	Goderich.	Hay, Geo	Lachute, Que.
Bawden & McDonell.....	Exeter.	Henderson, Jas.....	Belton.
Berry & Geiger.....	Hensall.	Hendrie, Jr., Wm.....	Hamilton.
Crossley, H. N.....	Rosseau.	Hodgkinson & Tisdale....	Beaverton.
Dalgety, Jas	London.	Hodson, F. W	Ottawa.
Drury, F.	Charing Cross.	Hogate, J. B.....	Toronto.
Galbraith Bros.....	Orangeville.	Messenger, D. H..... ..	Guelph.
Gardhouse, C. S.....	Humber.	Mossop, Wm.....	St. Marys.
Gardhouse, J. M.....	Highfield.	Snell, E	Galt.
Gardhouse, John.....	Highfield.	Stott, F. J.....	Brandon, Man.
Graham, T. E.....	Claremont.	Wellington, W. E.....	Toronto.
Graham, Robert..... ..	Claremont.	Wilkie, William.....	Toronto.

RE LIEN ON HORSES.

Moved by William Hendrie, Jr., seconded by John Gardhouse, "That we recommend that the lien be affixed to the mare and colt, the same as was recommended by the Clydesdale Association." Carried.

On motion of John Gardhouse, seconded by Robert Graham, it was resolved : "That the memorial from this association to Ex-Governor Francis, President of the World's Show at St. Louis in 1903, asking for the appointment of W. E. Skinner as Director General of Live Stock, be signed by the President and Secretary on behalf of all the members."

SHIRE WINNERS AT THE TORONTO INDUSTRIAL EXHIBITION, 1901.

Stallion and Four of His Progeny, not over 2 years old.

1st. Belshazzar (imp.) [296] (13855) bay, foaled in 1901. Bred by R. Tomlinson, Blackburn, Eng. sire, Timon (5394); dam, Ives (12596). Exhibitors, Bawden & McDonell, Exeter, Ont.

Stallion, four years old and upwards.

1st. Belshazzar (imp.) [296] (13855) bay, foaled in 1891. Bred by R. Tomlinson, Blackburn, Eng. sire, Timon (5394); dam, Ives (12596). Exhibitors, Bawden & McDonell, Exeter, Ont.

2nd. Calthorpe Loyalty [295] (17867) brown, blaze, small patch on near fore coronet, hind legs white, foaled in 1897. Bred by Col. H. Platt, Llanfairfechan, N. Wales; sire, Duke of Clarence 2nd (13001); dam, Compton Hopeful (14471). Exhibitor, W. Rae, St. Paul's, Ont.

3rd. Wilcott Thumper [294] (18552) bay, stripe on face and on off fore feet, near fetlock white, foaled in 1897. Bred by John Green, Wilcott, Shrewsbury, Eng; sire, Wilcott Carbon (14940); dam, Darby (16493). Exhibitors, Bawden & McDonell, Exeter, Ont.

4th Desford Marquis [321] (16639) bay, blaze on face, four white legs, foaled June 21, 1896. Bred by W. and J. Thompson, Baron's Park, Desford, Eng.; sire, Sopwell Duke (14502); dam, Desford Duchess of Bridgewater. Exhibitor, E. C. Attrill, Goderich, Ont.

Stallion, 3 years old.

1st. Royal Gauger [322] (18329) bay, foaled in 1898. Bred by O. P. Jones, Brynguran, Anglesea, Wales; sire, Calthorpe Gauger (12902); dam, Lady Frances (15065). Exhibitors, Bawden & McDonell, Exeter, Ont.

Stallion, 2 years old.

1st. Wrydeland's Chancellor [325] (19265), brown, foaled in 1899. Bred by Henry Stokes, Hansford, Eng.; sire, Thornton Chancellor (15893); dam, Pink (26651). Exhibitor, J. B. Hogate, Sarnia, Ont.

2nd. Pelham Boy [284] bay, star in forehead, nigh fore foot white, hind foot white, foaled in 1899. Bred by exhibitors; sire, Pride of Hatfield (imp.) [256] (13103); dam, Beatrice (imp.) [97]. Exhibitors, Morris, Stone & Wellington, Fonthill, Ont.

3rd. Pride of Morning [304] dark brown, star on forehead, hind feet white, foaled May, 1899. Bred by Morris, Stone and Wellington, Fonthill, Ont, ; sire, Pride of Hatfield (imp.) [256] (13103); dam, Queen, [65] Exhibitor, John Gardhouse, Highfield, Ont.

Yearling Colt, Entire.

1st. Vulcan 2nd [318], roan, white face, white spot on belly, hind legs white to gambril, near fore leg white to knee, off fore leg spotted to knee, foaled in spring of 1900. Bred by exhibitors; sire, Bahaillon Vulcan (imp.) [294] (16502); dam, Lena [81]. Exhibitors, Morris, Stone & Wellington, Fonthill, Ont.

Stallion, any age.

1st. Belshazzar (imp) [296] (13855). Exhibitors, Bawden & McDonell, Exeter, Ont.

Filly, 3 years old.

1st. Leila [131] brown, white legs, foaled in 1898. Bred by Jno. Lewis, Wales; sire, Ingomar 2nd, 14112); dam, Nadine (17081). Exhibitors, Morris, Stone & Wellington, Fonthill, Ont.

Filly, 2 years old.

1st. Rose [145] bay, one white foot, foaled in 1899. Bred by exhibitors; sire, Pride of Hatfie'd (imp. [256] (13103); dam, Queen [65]. Exhibitors, Morris, Stone & Wellington, Fonthill, Ont.

Yearling Filly or Gelding.

1st. Birdie [146] roan, white legs, foaled in 1900. Bred by exhibitors; sire, Bahaillon Vulcan (imp. [294] (16502); dam, Laura [112]. Exhibitors, Morris, Stone & Wellington, Fonthill, Ont.

2nd. Black Diamond, black gelding, foaled in 1900. Bred by exhibitor; sire, Darnley (imp.) [183 (3585); dam, Maggie's Blossom [140]. Exhibitor, C. S. Gardhouse, Humber, Ont.

Blood Mare, with foal of some breed by her side.

1st. Nelly Boy [122] bay, foaled May 23, 1895. Bred by Frank Drury, Charing Cross, Ont; sire, Orphan Boy (imp.) [178] (10120); dam, Norwood Nell (imp.) [58] (8593). Exhibitors, Bowden & McDonell, Exeter, Ont.

3ad. Leta [101] light bay, white face, stockings on hind legs, off front foot white foaled Jan. 1893. Bred by exhibitors; sire, Chieftain 2nd (imp) [194] (5723); dam, Lancashire Lass (imp.) [70] (2526). Exhibitors, Morris, Stone & Wellington, Fonthill, Ont.

Foal of 1901.

1st. Bachelor Boy foaled in 1901. Bred by exhibitors; sire, Belshazzar (imp.) [296 (13855); dam, Nelly Boy [122]. Exhibitors, Bowden & McDonell, Exeter, Ont.

2nd. Lancashire Lass [158] light bay, white face, white on off fore and near hind legs, foaled in spring of 1901. Bred by exhibitors; sire, Mars (imp.) [275] (17103); dam, Leta [101]. Exhibitors, Morris, Stone & Wellington, Fonthill, Ont.

Mare, any age.

1st. Laura [112] bay, stripe on face, near front and both hind legs with white stockings, foaled May 1, 1896. Bred By Morris, Stone & Wellington, Fonthill, Ont.; sire, Pride of Hatfield (imp.) [256] (13103); dam, Daisy [82]. Exhibitor, John Gardhouse, Highfield, Ont.

HARNESS, HUNTER, AND SADDLE HORSE SOCIETY OF CANADA

ANNUAL MEETING.

The second annual meeting of this Association was held in the Albion Hotel, Toronto, at 8 p.m., February 5th, 1902. In the absence of the President, Mr. Walter Harland Smith took the chair.

On motion, the minutes of the last annual meeting were taken as read.

The Treasurer read the Financial Statement, which was adopted, and the Secretary's Annual Report was confirmed after a brief discussion.

SECRETARY'S REPORT.

It is necessary to report one more year of virtual inactivity so far as this society is concerned. Since the last annual meeting when the President delivered a most practical address and a resolution was passed favoring the licensing and inspection of stallions, nothing has been done. Yet it would seem that there are many ways in which the Society might be made of use if the members would but take more active interest in it.

Saddle and carriage horses are year by year becoming more and more valuable, and, therefore, are also becoming worthy more and more of systematic encouragement. Only on Tuesday evening the Clydesdale Association, the most important and strongest of all the business horse organizations in the country, declared that the time had arrived for holding a show of its own. This means that the saddle and the carriage horse have usurped the place at the horse shows formerly held by the heavy draught classes. At Boston the other day the Directors of the Horse Show declared in favor of paying more attention than has hitherto been done to the saddle and harness classes. "New York exhibitors," according to the New York Herald, "are much pleased with this change in the programme, and many of them are hopeful that the Directors of the National Horse Show will follow the lead of Boston to some extent in framing the prize list for the next exhibition at the Garden."

This is not pointed out in order to exalt the saddle and the carriage horse at the expense of the draught classes pure and simple, but to show that the part played by the horses whose cause this society was formed to espouse, is destined to continually increase in importance and prominence. It is, therefore, surely befitting that the society's Executive should be up and doing.

Among the many matters that might advantageously be considered are shipping and transportation, the export and import trade advice to breeders, the inspection of stallions, the tariff, the conditioning of horses for sale and exportation, the attitude toward the horse of the Dominion, Provincial and civic Governments, the maintenance of a book containing the addresses of stallion owners and breeders, registration of important sales, and keeping track of the sires of horses that sell well, or win in the ring, and the general advancement of the horse and his master.

In a report such as this it would be presumption to express an opinion as to the manner in which these questions should be dealt with, but that they come within the scope of the society is undoubted. There is one observation that it may be permissible to make, namely, that the interests of the horse are the interests of the public, that the interests of the public are the interests of the dealer, and that the interests of the dealer are the interests of the breeder. In fact, it can fairly be said the better the horse the better the man.

It has been suggested that this is a dealer's society. If it is a dealer's society there is no disgrace attached to the term. The dealer is as necessary to the breeder as the merchant to the manufacturer, and is entitled to equal respect. As a matter of fact, however, the constitution provides that "Any breeder, purchaser, seller, exhibitor or owner of one or more saddle horses or carriage horses whom the Executive may approve, shall be eligible for membership."

The society, through the kindness of Vice-President Harland Smith and Director George Pepper gave two prizes during the year just closed, one of $60 to the Horse Show for the champion harness horse and one of $50 to the Industrial Exhibition for the champion saddle horse. The first was won by Mr. G. H. Gooderham's black mare South Africa, and the latter by Mr. George Pepper's bay gelding Lord Minto.

The society, it might also be mentioned, through the efforts of Dr. Andrew Smith, has secured representation in the Industrial Exhibition Association.

You will further be pleased to hear that several members of the society were during the past year, as in former years, represented at the principal horse shows both in the United States and Canada, and succeeded in every instance in carrying off a goodly share of premiums.

All of which is submitted.

H. J. P. GOOD.

FINANCIAL STATEMENT.

Gentlemen,—My duties have been light during the last year, and my services have only been required as Treasurer, and my report in that capacity is as follows :

Receipts.		Expenditure.	
Balance from 1900	$21 50	Premium, Special at Industrial	$50 00
12 members, at $2	24 00	Postage, stationery and auditor	7 50
Balance owing Treasurer	12 00		
	$57 50		$57 50

I hereby certify that I have examined the books of the Saddle and Carriage Horse Society and the above statement is correct and in accordance therewith.

Chas. F. Complin, Auditor,

H. Wade, Secretary.

Toronto, January 20th, 1902.

GENERAL BUSINESS.

Ald. O. B. Sheppard stated he believed he had one of the best roadster horses in the world, and wished to know if they interpreted the by-laws of the society to mean that they included roadster horses or not.

A lengthy discussion arose as to whether the society included roadsters and hunters, and on motion of George Pepper, the constitution was suspended in order that it might be renamed and the by-laws revised.

Moved by Adam Beck, seconded by W. T. Merry, "That the name of this Association be changed to the "Harness, Hunter, and Saddle Horse Society of Canada." Carried.

On motion of Adam Beck, seconded by Geo. Pepper, it was resolved, "That the Secretary, H. J. P. Good, revise the by-laws and constitution of this society in accordance with the name of it."

Messrs. Adam Beck, Geo. Pepper, T. Crowe and Walter Harland Smith each volunteered $50 towards a prize fund, and on motion of Adam Beck, seconded by Jas. Murray, it was resolved, "That the amount donated be given in the shape of a silver cup for each of the breeds following, to be won twice by the same exhibitor at the Spring Horse Show: The best roadster, the best heavy carriage horse, the best hunter, and the best saddle horse, all to be the bona-fide property of the exhibitors."

Moved by H. J. P. Good, seconded by Ald. O. B. Sheppard, "That if the winner of the cup wishes to take it out of the hands of the Treasurer he shall be required to give a satisfactory bond to the Secretary for the cup." Carried.

Ald. O. B. Sheppard moved, seconded by Adam Beck, "That the President, Vice-President and Secretary be instructed to send a circular ot explanation of the objects of the Association to those likely to take an interest in its objects, with a view to enlarging the membership." Carried.

On motion it was resolved, "That a special committee consisting of S. B. Fuller, representing the saddle class; Walter Harland Smith, harness class, and Adam Beck the hunting class, with the addition of W. T. Merry, be a committee to use ways and means between now and the coming Horse Show to secure members for this society." Carried.

Adam Beck moved, seconded by W. T. Merry, "That a vote of thanks be tendered to the gentlemen, Mr. H. J. P. Good and Mr. Henry Wade, who so kindly and efficiently acted as Secretary and Treasurer of this society." Carried.

On motion, it was resolved that Mr. H. J. P. Good be appointed Secretary of the Society with not a fixed salary, and that Mr. Henry Wade act as Honorary Secretary-Treasurer.

A vote of thanks was also tendered the gentlemen who so kindly contributed towards the prize fund of the society.

OFFICERS FOR 1902.

President—Walter Harland Smith, Toronto.

First Vice-President—Ald. O. B. Sheppard, Toronto.

Second Vice-President—Thomas Crowe, Toronto.

Directors—W. C. Brown, Meadowvale; T. H. McCartney, Thamesford; Jas. Murray, Toronto; W. T. Merry, Toronto; Adam Beck, London; S. B. Fuller, Woodstock; Dr. Andrew Smith, Toronto; E. W. Cox, Toronto; George Pepper, Toronto; William Hendrie jr., Hamilton.

Representatives on the Board of the Canadian Horse Breeders' Association—Adam Beck, London, and Ald. O. B. Sheppard, Toronto.

Delegates to Toronto Industrial—Walter Harland Smith, Toronto, and W. T. Merry, Toronto.

Honorary Secretary and Treasurer—H. Wade, Toronto.

Secretary—H. J. P. Good, Toronto.

The meeting then adjourned.

CANADIAN HORSE BREEDERS' ASSOCIATION.

ANNUAL MEETING.

The eighth annual meeting of the Canadian Horse Breeders' Association was held at the Albion Hotel, Toronto, at 2 p.m., February 6th, 1902.

Moved by H. N. Crossley, seconded by Geo. Pepper, "That the minutes of the last meeting be taken as read." Carried.

On motion, the Secretary-Treasurer's report was adopted.

REPORT OF THE SECRETARY-TREASURER.

The past year has again been prosperous for both breeders and dealers of horses. The steady demand for artillery and cavalry horses for war purposes has taken from this country at fair prices a good many thousands.

A steady demand for good Saddle and Carriage horses has continued all the season, as well as for Heavy Draught horses, both for breeding and carting purposes. In fact, it has been the most successful horse season that we have had for several years, both in a mercantile way and in the show ring.

Mr. A. P. Westervelt informs me that quite a number of horses were taken to the Northwest in Government cars for breeding and working purposes, so that the $50 voted towards the wages of the men in charge was utilized.

Our Canadians have been very successful in the show ring this year, both at home and abroad. At the Pan-American at Buffalo Canadian horsemen were well represented, and were very successful winners. In Thoroughbreds, the Telfer-Climie Company of Montreal took first honors. Canadian Clydesdales swept everything before them, capturing every prize offered for this class of horse. Graham Brothers of Claremont won first in the three classes for stallions and first for three?year-old mares. Hodgkinson and Tisdale of Beaverton were awarded first for one-year-old and two-year-old fillies and brood mare with foal. Other winners were H. G. Boag, Churchill; Robert Ness, Howick, Que.; Thomas Skinner, Mitchell; Slack & Whelihan, St. Mary's, and A. G. Gormley, Unionville.

In Shires Messrs. Bawden and McDonell of Exeter won the principal prizes. In Standard Breds D. F. A. Hyslop of Appleby won a second with Pavonia. Mr. Wilton Stong of Willowdale, and G. W. Kennedy of Ilderton were winners.

In Hackneys Robert Beith, M.P., Bowmanville, took second place with Robin Adair 2nd. But this same horse, a short time after at the New York Horse Show, won first and championship. Graham Bros. also won great honors at the International Live Stock Show at Chicago in the month of December.

Mr. George Pepper, Toronto, Messrs. Crow and Murray, Toronto, and Mayor Beck of London also won lots of honors for Canadians in the United States.

Our Canadian Horse Show has no doubt done a great deal in stirring up a feeling of emulation in our breeders and owners of horses, and has helped to make a success of horse breeding in this country, as its object is to encourage the improvement of all the better breeds of horses in every possible way.

We welcome a new Association called the Canadian Pony Society to our councils, they sending two delegates to attend this meeting.

The Hon. John Dryden, Minister of Agriculture, is preparing a Horse Breeders' Lien Act to be passed this session, but would like your opinion as to whether it should be made to follow the colt, like the Manitoba Lien, or that the owner of the colt be liable to be followed to realize the amount.

The Committee, consisting of Robert Miller and D. McCrae, have prepared rules and regulations governing societies desiring to secure the bounty or premiums for stallions, as passed last year, and largely distributed through an advertisement in the Farming World. No applications were received, but no doubt there will be this year.

THE CANADIAN HORSE SHOW, TREASURER'S STATEMENT, 1901.

Receipts.		Expenditures.	
Sundry subscriptions	$ 945 00	Prizes	$3,827 00
Horse Breeders' Association	2,050 00	Military grant	750 00
Toronto electoral grant	25 00	Expense of running show	1,171 28
Hackney Horse Association grant	50 00	Profit :	
Entry fees	1,354 00	Horse breeders $851 64	
Proportion of general receipts	3,027 56	Country and Hunt Club 851 64	1,703 28
	$7,451 56		$7,451 56

CANADIAN HORSE BREEDERS' ASSOCIATION, FINANCIAL STATEMENT FOR THE YEAR ENDING DECEMBER 31st, 1901.

Receipts.		Expenditures.	
Balance from 1900	$2,905 71	Premium, Industrial Fair	$ 25 00
Legislation grant	2,000 00	Canadian Horse Show	2,050 00
King Edward prize	50 00	Expenses of banquet	170 70
Interest on deposit	90 41	Auditor and stenographer	13 00
66 members at $1	66 00	Stationery, postage, etc	71 23
Share of profits, Horse Show	851 64	Toronto Hunt, one-half claim Burns	15 73
		Share Government car	50 00
		Balance on hand	3,568 10
	$5,963 76		$5,963 76

I hereby certify that I have examined the books of the Canadian Horse Breeders' Association, and the above statement is correct and in accordance therewith.

Chas. F. Complin, Auditor.
H. Wade, Secretary-Treasurer.

Toronto, Ont., January 20th, 1902.

PRESIDENT'S REMARKS.

By Dr. Andrew Smith, Toronto.

I have no particular President's address, further than it is very pleasing indeed to see so many here representing the Canadian Horse Breeders' Association. The Horse Show in the spring, as you are aware, was very successful, and the Horse Show at the Industrial was also very successful, and I believe the last show in connection with the Industrial as regards all sorts of live stock has been unequalled. Of course, the breeders and owners of horses are having better times than a few years ago. Horses of all kinds are increasing in value, and particularly heavy horses, and all horses are commanding fair prices. I believe the Canadian Horse Breeders' Association has done something to improve matters together with the general prosperity of the country. I may just mention that the amount of money given at the Canadian Horse Show last year for Hackneys, Shires, and Cyldesdales was $1,035; for Thoroughbreds, Carriage, and Standardbreds, $710, or a total of $1,745, which was a fair amount of money given.

OFFICERS FOR 1902.

President—Dr. A. Smith, Toronto.

First Vice-President—H. N. Crossley, Rosseau.

Second Vice-President—Thomas Graham, Claremont.

Directors—Thoroughbred Association—Dr. Andrew Smith, Toronto, and William Hendrie jr., Hamilton.

Harness, Hunter and Carriage Society of Canada—Mayor Adam Beck, London, and Ald. O. B. Sheppard, Toronto.

Hackney Horse Society—John McDonald, Toronto, and Robert Beith, M.P., Bowmanville.

Trotting and Pacing Horse Association—George Pepper, Toronto, and W. E. Wellington, Toronto.

Clydesdale Horse Association—Jas. Dalgety, London, and Thomas Graham, Claremont.

Shire Horse Association—Jas. M. Gardhouse, Highfield, and H. N. Crossley, Rosseau.

Draught Horse Association—Alex. Innes, Clinton, and Jas. Henderson, Belton.

Canadian Pony Society—H. M. Robinson, Toronto, and W. K. Knowlton, Toronto.

Delegates to Industrial Exhibition—William Hendrie, jr., and Thos. Graham.

Delegates to Western Fair—Col. McEwen, Byron, and O. Sorby, Guelph.

Secretary-Treasurer—H. Wade, Toronto.

LIST OF MEMBERS.

Adamson, T. M., Toronto.
Agar, A., Nashville.
Ansley, Mr., Toronto.
Archibald, C. A., Truro, N.S.
Attrill, E. C., Goderich.
Barron, Geo., Toronto.
Beck, Adam, London.
Berry & Geiger, Hensall.
Biggins, W. J., Clinton.
Boag, H. G., Churchill.
Boeckh, Chas., Toronto.
Bond, Robert, Toronto.
Bright, John, Myrtle.
Brown, W. C., Meadowvale.
Campbell, E. T., Toronto.
Canfield, James, Woodstock.
Cargill & Son, H., Cargill.
Carstair, S. D., Bomanton.
Colville, W. K., Toronto.
Cox, E. W., Toronto.
Crow, T., Toronto.
Dalgety, Jas., London.
Davidson, John, Ashburn.
Davidson & Son, Jas. I., Balsam.
Dietrich, J. C., Galt.
Edwards & Co., W. C., Rockland.
Elliott, C., V.S., St. Catharines.
Gardhouse, John, Highfield.
Gardhouse, Jas. M., Highfield.
Good, H. J. P., Toronto.
Graham, Robert, Claremont.
Graham, Thos., Claremont.
Green, E. Price, Toronto.
Henderson, Jas., Belton.
Hendrie, Wm., jr., Hamilton.
Hodgkinson & Tisdale, Beaverton.
Hodson, F. W., Ottawa.
Innes, Alex., Clinton.
Irving, T., Winchester.
Isaac, John, Markham.
Jackson, W. H., jr., Toronto.
McDonald, John, Toronto.
Meredith, L., London.
Miller, Robert, Stouffville.
Mills, Dr. J. A., Toronto.
Mitchell, Jas., Goderich.
Mitchess, Jas., Goderich.
Moore, Geo., Waterloo.
Murray, Jas., Toronto.
McCrae, Lieut.-Col. D., Guelph.
McEwen, Lieut.-Col. R., Byron.
McGillivray, John A., Uxbridge.
New, J. H., Toronto.
Nimmo, William, Coleman.
Pember, W. T., Toronto.
Quinn, J. F., Brampton.
Richardson, Fred, Columbus.
Robertson, Major, Toronto.
Robinson H. M., Toronto.
Robertson, J. Ross, Toronto.
Robson, Capt. T. E., Ilderton.
Russell, H., Toronto.
Russell, J. & W., Richmond Hill.
Sheppard, Ald. O. B., Toronto.
Simpson, D. B., Bowmanville.
Simpson, H. E., Toronto.
Smith, Andrew, M.R.C.V.S., Toronto.
Smith, Dr. D King, Toronto.
Smith, Walter H., Toronto.
Smith, William, Columbus.
Sorby, O., Guelph.
Watt, J. & W. B., Salem.
Wellington, W. E., Toronto.
Wilkie, William, Toronto.
Woods, T. Ambrose, Toronto.

PREMIUMS FOR STALLIONS.

The Secretary read the rules and regulations governing societies desiring to secure the bounty, and they were adopted with the alteration in clause 12, as given below.

Moved by Colonel D. McCrae, seconded by Jas. Henderson, "That the same premiums as offered for stallions last year be continued this year, and that clause 12 of the rules and regulations be amended to read : 'The fees for service shall not be less than $5, payable after the service on the first of October after the season, and not less than $5, payable February 1st the following year if the mare proves in foal." Carried.

LIEN ON MARES.

The Secretary stated that Mr. C. C. James, Deputy Minister of Agriculture, was at present preparing a Lien Act somewhat on the same lines as the one now in force in Manitoba, and wished to know if it met with the approval of the meeting, and, if so, should the lien be attached to the mare only or the mare and the colt.

Mr. Mitchell wished to know if it included all kinds of stallions.

Dr. Smith said it was to include all sorts of horses, and the lien was to be on the mare and the foal.

Mr. Mitchell was desirous of seeing a copy of the Act, but as the Secretary had not one present Mr. J. A. Turner explained that if a man did not pay the service fee for a colt, and if he did not register a claim against him, then upon the payment of a fee of 10 cents and signing a statutory declaration the stallion owner could have a lien on the colt. He thought this Act worked well in the west.

Mr. John A. McGillivray stated they had the Act of the Manitoba Legislature before them in the Clydesdale meeting, and it was a very simple act with very few provisions, and the provision as mentioned by Mr. Turner was contained therein. The security the stallion owners had now was simply a man's promise to pay, and a great many stallion men have claimed to have been cheated in the past by mares getting out of the community after being served. The Manitoba Act was not quite what they thought it was, so the other night they passed a resolution memorializing the Government to have the lien placed on the mare and colt, and if the man owning the col paid, or the man owning the mare paid the fee, it did not matter as long as it was paid, but every purchaser of a mare in foal would be on his guard, knowing that such an Act was in force, and he would see that such fee was paid before he paid for the colt or the mare. If the fee was not paid within a year the stallion owner could go before the County Court and on payment of a fee of 10 cents get the fee of $10 or $15, whatever the Manitoba Act has, on the colt, and we ask it to be a double-header.

Ald. O. B. Sheppard : I do not think it is a fair Act, that it is a class legislation and gives some people more right to collect their debts than other people. The storekeeper who sells his goods does not have a lien, and why should he not have the same privilege ? It is an unfair proposition to give any class lien on something the general public has not a lien.

Mr. John A. McGillivray : If there was any element of unfairness in it I would not consent to it, but I fail to see wherein it is unfair. Have you not increased the value of that mare so much by the use of that stallion on your mare ? Mr. McGillivray stated that the lien law applied to land, and, in fact, ran all the way through our property system, except in the case of stallions, and said it should be applied there as well ; and he did not think there was a man who had a mare ought to complain of this lien.

Mayor Beck of London said the travelling of stallions at best was a losing investment, and unless the stallion owners were protected they could not look for an improvement in the breed of horses in this country.

Alex. Innes : The only difficulty I can see in the way is the man purchasing the mare may not know of the lien.

Major McGillivray : He will be put on his guard.

The following resolution was then passed : Moved by Adam Beck, seconded by James Henderson, "That the Lien Act, as passed by the Shire and Clydesdale Associations, affixing the lien to the mare and colt, be endorsed by this Association." Carried.

Moved by John A. McGillivray, seconded by Jas. Henderson, "That the committee to wait upon the Government in connection with the Lien Act be the President, John A. McGillivray, Wm. Hendrie, jr., and the Secretary." Carried.

On motion of D. McCrae, seconded by John A. McGillivray, it was resolved, "That this Association vote the sum of $50 towards paying the wages of a man in charge of live stock cars going to the west."

HORSE SHOW.

A letter was read from Mr. Stewart Houston, stating that the Country and Hunt Club were willing to join with the Horse Breeders' Association in holding another Spring Show on the same terms as last year.

Mr. David McCrae : At the meeting of the Clydesdale Association the feeling was very strongly expressed that the Spring Stallion Show, as being carried out now, was not giving the returns to the breeders and farmers of Canada that we had hoped it would. One great reason of that is the time at which it is held is too late. In former times we had it as early as in March and the latter part of February; that is a very much more suitable time for stallion owners of heavy breeds than in any later date, in fact, the feeling amongst the Clyde breeders is this, that a date earlier than that is exceedingly desirable ; probably not later than the 15th of February. One chief reason for making it so early is that the C.P.R. give to the Northwest breeders special rates beginning in December and continuing for three months, and they have to be back home before the first of March. A great many take advantage of these cheap rates, and among those doing so are possibly purchasers of stallions, and it is exceedingly desirable while these Northwest buyers get special rates down here they might see horses for buying here before they return.

Another reason why we wish to have the show earlier is that we want to encourage the system of purchase by farmers' clubs of stallions for service in different localities in Ontario. If the show was held at a sufficiently early period representatives of farmers' clubs could come to the show, select the horses they want, and have time to fit them for the spring routes. It is impossible for this to be done now because last year farmers had actually begun their spring plowing before the Horse Show was held.

Now, the Northwest is promising to be a very good market for stallions imported into and bred in Ontario. So good is it that American dealers in heavy horses are paying special attention to it at the present time, and I am told two carloads of heavy bred horses are now on sale in Brandon, and breeders, especially on the American side are doing what they can to push horses into the Northwest Territories. What we want is to get that expanding trade, and one means of securing it is having our Spring Show at a time when possible purchasers from the Northwest can come here and make their selections at one point.

We do not want to quarrel with the management of the Spring Show. We think the exhibition has done good. But we do feel, as breeders, a little out in the cold, and that the show as at present carried on is practically a failure as a means of bringing buyers to us.

We would like also to have the educational features brought out more strongly than at the present. We would like to see more farmers brought here in order to give them an idea of the horses that should be produced to bring the best price. We also want to have eight or ten classes. But above all else we want to bring buyers and

breeders to see the horses we have to sell, and at a time which will enable them to buy and fit up for the spring service, and April is too late for that. We want the show early enough to satisfy the breeders and farmers of Canada.

Ald. O. B. Sheppard : Are you satisfied if you and the Horse Breeders' Association can agree on a right date.

Mr. David McCrae : We want more prizes and a greater number of classes.

Mr. John A. McGillivray : The Clydesdale Association appointed a committee to meet the Horse Breeders' Association, with a view to having the show as early as possible. Mr. Turner felt very strongly on that matter. There was no desire to pull away from the Canadian Horse Breeders' Association, but to keep on together was the desire if we could meet one another's wishes, but if we cannot, why, then, the breeders will have to meet at an earlier date, perhaps February (if we could not get you to meet in March), and have another Horse Show. Another thing, farmers want to come up and go back on the same day, and there is some complaint at present of heavy horses not all being shown on one day, but going on from day to day.

Peter Christie : There is a general feeling I know, with the Clydesdale men, that the Spring Horse Show does not answer their purpose, that it is too late in the season, and does not bring into the show the class of people they deal with. If there is not a change in the date the feeling of the Clyde men is that we will have to go back to the old breeders' spring show, I am satisfied that if there is not something done to meet the wishes of the Clydesdale men they are going to pull out entirely, because they do not meet the class of people they wish to do business with. I think the two together make a very fine show, and I think whoever compose the Board should consider it very carefully and try and keep them together, but they must do something in order to meet the wish of the Clydesdale men.

Mr. Thomas Graham expressed the same views as Mr. McCrae. He thought the show should be held about the latter part of February, to suit the people in general, and thought they would fall in with the Spring Horse Show if held early in March, but as far as showing in April, it was out of the question from a breeders' standpoint.

Mr. McGillivray : As regard holding the two shows, there is a danger of opposition springing up once another show is established, and then you have got the protection of the Government grant to consider. There is a great danger of having two shows within a month of each other.

Ald. O. B. Sheppard suggested a conference for the purpose of considering the whole matter, with a view of arriving at some agreement.

President Smith doubted if a show such as has been held during the past few years could be made a success if held at an earlier date than April. In Glasgow they had a show in March that was mostly for heavy horses, but a show for young horses and mares, and every thing of that sort, was held in April and May.

Mr. George Pepper : Is not the $2,000 grant given to the Breeders' Association, and if the breeders broke off and start alone would it not go to the breeders and not to the Canadian Horse Breeders' Association. And if you take that amount from the Canadian Horse Breeders' Association you would find some trouble in running the show.

The Secretary : The Horse Breeders' Association was started for the purpose of receiving this grant, and it could not be divided up amongst the different associations, as this association was formed to represent them all.

Dr. Smith : I think the Government would give to the Canadian Horse Breeders' Association, and we could give to each.

Ald. O. B. Sheppard : The trouble in that strikes me you would be entailing a double expense, and the result would be only one of the two shows would be profitable and great deal of loss of usefulness. If you divide the shows I do not think it would be beneficial.

Moved by Adam Beck, seconded by John A. McGillivray, "That we ask our representatives to do all in their power, when they meet the representatives from the Toronto Hunt Club, to arrange for a Spring Show at as early a date as possible." Carried.

Mr. McGillivray said the show was a little later last year on account of the military, but thought it could be arranged to have it a good deal earlier this year.

Mr. Wade: Another thing is to have all the heavy horses shown on one day, and the directors be requested, as far as possible, to meet the views of the breeders of heavy horses in holding the show this year. This suggestion was adopted.

Moved by Adam Beck, seconded by H. N. Crossley, that the Secretary be requested to inform the Trotting and Pacing Horse Association that they appoint their representatives before a certain date next year. Carried.

The meeting then adjourned.

DIRECTORS' MEETING.

The Directors appointed a President and two Vice-Presidents, whose names will be found in the list of officers.

On motion, the following gentlemen were appointed representatives from this Association on the Joint Horse Show Board: Dr. Andrew Smith, John McDonald, James M. Gardhouse, Thomas Graham, H. M. Robinson, William Hendrie, jr., George Pepper, H. N. Crossley, Robert Beith, M.P., W. E. Wellington, Adam Beck, O. B. Sheppard, James Dalgety, and the Secretary.

The following committee were chosen as a Special Committee to arrange for the Horse Show in conjunction with the Hunt Club: Dr. Andrew Smith, John McDonald, Jas. M. Gardhouse, William Hendrie, jr., Thomas Graham, Adam Beck, O. B. Sheppard, George Pepper, H. N. Crossley, and the Secretary.

A letter was received from the Assistant Secretary of the Pony Society, stating that H. M. Robinson and W. H. Knowlton had been elected delegates from that Association on the Board of the Canadian Horse Breeders' Association.

On motion, these two delegates, with the others appointed by the different other associations, were made the Directors of this Association.

The following letter was read from Mr. George Harcourt, Secretary-Treasurer of the Horse Breeders' Association of Manitoba:

Winnipeg, January 11th, 1902.

Dear Sir,—I have been instructed to write you asking what reception or standing at your annual meeting you would give an accredited representative of this Association. The Executive feel that there are a number of questions which could be taken up with you by such a delegate much more satisfactorily than by correspondence. Among the questions we would like to discuss with you are:

(1) The advisability of urging upon the Dominion Government the necessity of increasing the minimum valuation on horses entering Canada from the United States. The object in this is to shut out or diminish the importation of cheap western bronchos. We have suffered seriously from this, and I believe Ontario is beginning to feel it now too. The duty should be pad in the same minimum valuation as our horses have to pay when going into the United States.

(2) The question of urging the Dominion Government to take control of the horse breeding upon the Indian Reserves, supplying them with suitable stallions and doing away with their cayuse stallions, which are now causing serious loss to settlers. The Government has done something in this way with bulls, why not with stallions? These cayuse stallions run at large and serve settlers' valuable mares; the colt produced is practically valueless.

(3) Some plan of closer unity of the various horse breeding associations of the Dominion, so that all may be able to work together for a common cause.

Kindly inform me when your annual meeting takes place.

Will you please consider this letter as sent to you as Secretary of the Clydesdale, Shire, Hackney and any other horse association of which you may be secretary.

The Secretary stated that he had written Mr. Harcourt, saying they would be pleased to have a delegate from their Association to lay the various matters before them.

Mr. Adam Beck, of London, said that they had a lot of these bronchos brought into London, and all the duty paid per head was $2, and they sold for $40 each. He, as well as the other members, thought some action should be taken to remedy this evil.

On motion, it was resolved: "That Lieut.-Col. D. McCrae and Robert Beith, M.P., act as a committee to interview the Dominion Government to see what could be done in the way of preventing these cheap western bronchos from flooding the country."

Mr. George Pepper asked the Directors present representing heavy horses the latest date they could come to the show.

Mr. Dalgety said the first week in April was about the right time.

Moved by George Pepper, seconded by James Henderson, "That the committee appointed be instructed to have a meeting at once and inform the Horse Show Committee that the breeders refuse to hold any show with them unless held the first week in April, and that we be able to answer the breeders a week from to-day, Thursday, February 13th." Carried.

GRANT TO EXHIBITION FOR PRIZES.

Moved by George Pepper, seconded by H. N. Crossley, "That $250 be given from the funds of this Association to the prize list of the Toronto Industrial Exhibition, and that the Directors of the Horse Breeders' Association divide it as they see fit." Carried.

The meeting then adjourned.

ANNUAL DINNER.

The third annual dinner of the Canadian Horse Breeders' Association was held at the Walker House, Toronto, on the evening of February 6th, at the conclusion of the annual live stock meetings, and was very successful.

The dining hall was well filled, the toast list was not too long, and the speeches were brief and noted for their good points.

ADDRESS BY HON. JOHN DRYDEN.

I have never forgotten to love good horses, so I am here to-night to express my sympathy with the work you have in hand as horse-breeders of the Province of Ontario. The horse-breeders have had their ups and downs, and they have had adversity in the days gone by as well as prosperity. I am told at the present moment horses are rather on the up-grade, and there is a brighter outlook for them, notwithstanding the electrical developments of the past in this country, and the proposed developments of the future. What I think we need most of all among the horse-breeding fraternity is some definite ideal, some definite purpose.

In the past our farmers generally have bred scarcely anything but horses of a heavier class, and our market for these was in the United States. Now, we were not all prepared to breed the best horses of that class in the beginning, but little by little became educated, and we know better now than we did then what is required.

But what I want to impress upon you is, that in order to succeed in this industry you must have something definite before your mind; so, therefore, if a man breeds horses by accident you cannot expect many horses prepared to do any particular work which you had in hand. Again, the times change, and after we have learned how to

breed these heavy horses we find the market begin to dwindle, and almost die out, and the men who went into the country found they wanted something of another class, and then they complain to me personally, and say our farmers do not breed the right kind. At present the farmer breeds horses for his own use, and sometimes is willing to sell those he has to spare ; but the horse dealers have an ideal of another type. The farmer has not been educated to these requirements, and therefore does not produce them. You see lately our trade has been in army horses. We have had a considerable number bought in this country, but I venture to say you could go into almost any section and they cannot tell you what kind of horses are required, and if they did tell you they would not know how to go to work to produce them, as they may have the right mare and no particular sire to use. Now, the people need in this respect, as many others, education. Who is to do it ?

A voice : The Government.

Hon. Mr. Dryden : That is it, there you are again. "Let us have some law."—"The Government must." The Government has its duties and functions, but I submit with all due respect it is not the Government's business to carry on all this educational work. Now, what is the Horse Breeders' Association for ? What are the duties of the Horse Breeders' Association ? What is the object of gathering the horse breeders together ? Why do I recommend to the Legislature that they receive a grant ? It is that they might be a medium through which the educational work I have referred to may be carried on. We furnish the means, but you gentlemen in business, who know the business, we want you—because you receive the Government money—we want you to carry this education on in some form or other, in order to place before the people the ideal to which they are to try and attain. And if I were to criticize any at all in this respect, it would be on the ground that you do not impress yourselves enough upon the country. Now, if horse breeders believe there is some particular kind of horse to produce, then I want the people who are breeding horses to know it, and we will give you the means and help you, because if this Government in the Park believes in anything more than another, it is in helping those who are willing to help themselves. I do not believe in this plan of feeding by the Government ; I believe some duties must be performed by ourselves, and no Government or no Legislature will do these things. I suggest, therefore, you carry on this educational work, and in this respect let me say one of the means of doing it is in holding and conducting the Horse Show in this city. Now, that has an educational feature. Of course the city people take charge of it, and I think that is a great blessing. I know some of the country people complain, yet it is a great blessing to know the people who are wealthy in the city, and call themselves fashionable and fill the best homes, are willing to take an interest in this show, as it shows an interest in horse breeding in this country ; and I could, if I took time, show how much service this exhibition has been in promoting horse breeding all over this Province. It is not a local exhibition, because the prizes taken go to different points, and the people who exhibit all come from different points to this Provincial Exhibition. I notice in the papers that some breeders complain they do not get fair play; you do not make enough of them ; you make rather more of the spectacular side. There is a way of helping them out so far as the show is concerned. But while doing that, do not forget that the people in the country are hungering and thirsting for information along these lines as they never were before. An illustration of this was recently found in connection with the Agricultural School. A short course in stock judging was arranged for at the College, and 200 people applied for admission. I did not think we would get any more than forty or fifty applications, and here we had twenty or thirty more than we could accommodate. We have classes in horse judging, showing people the different good points in Clydesdales, Shires and Hackneys. This only indicates what is in the minds and hearts of the people all over the country, who want to do better. Now I shall be glad to see this Association impressing itself more and more on these lines, and when our people get a purpose before them they will work it out. It is no experiment. We have proved to the world we can produce horses with as good constitutions, as strong powers of endurance, as good feet, and as good legs, as can be produced anywhere ; but we want the horse breeders to know what particular type to produce.

I have, therefore, to congratulate you upon the outlook for this industry, as I have congratulated the Shorthorn men upon the outlook for their industry. I believe that live stock is going to boom from this time on, and you gentlemen must watch the turn the market takes, and try and produce what is wanted, and if that is done we will find a ready sale for what is produced. We must have horses always, no matter if there were a hundred times the electric machines used there are to-day.

Mayor Howland was of the opinion that more attention should be given by the farmers to the production of military horses. He said Col. Denison pointed out nearly a quarter of a century ago that horses would be required in greater rather than in smaller numbers for military purposes in the future, and one great far-seeing English military man read a paper before one of the military institutes in England about fifteen years ago in which he pointed out that the nation which would mount its riflemen and give them the mobility necessary to gain the advantage over the enemy, was the nation that would best succeed in defensive or offensive warfare, and the Mayor thought farmers should prepare to meet this demand.

Col. Leys expressed his pleasure with being among the horsemen. He quite agreed with all the Minister of Agriculture had said, but he did not go far enough. He should have told that the local Legislature of this Province had a large surplus and did not believe in hoarding up surpluses. Col. Leys also stated that he had been opposed to the granting of this $2,000 to this Horse Show in Toronto, because he had not felt the farmers got the benefit of it as they should, but he said he now did not object to the Government supplementing this amount with $3,000 more, and giving three large prizes in Ontario to three, four or five different classes of horses, to be named by the Minister of Agriculture. Continuing, he said: "I would say give a thousand to the City of Ottawa, a thousand to the City of Toronto, and a thousand to the City of London. It possibly would be advisable to give the prizes directly to the best brood mare with the best foal at its side, as this would encourage the farmer to keep good brood mares, which now go to the United States. I contend if we do that it would encourage breeding in this particular industry, which our farmer depends so much on, by giving these large prizes, and for these different classes of horses. Our farmers would look forward to breeding a better class of horse as this would encourage them to do so. The breeding of horses for the past ten years has been going down hill instead of up, owing to those engaged in the business not getting enough encouragement. I hope you gentlemen will urge upon the Government the necessity of granting money to the three different fairs, so that the money may be spread over, and the farmer himself will get the advantage not the ordinary horse dealer."

Mr. Alex. Innes said that in no department of agriculture could money be made more quickly than in the breeding of the right kind of horses, and in no line could money be lost more quickly than in the breeding of the wrong kind. The draught horse is a producer of wealth, while the fancy horse is a distributor of wealth; the one is used in industrial purposes, while the other is an object of pleasure. Mr. Innes thought the Agricultural School should purchase some good horses to serve as object-lessons for farmers as to the kind of animals that should be produced.

Mr. William Hendrie, jr., of Hamilton, said: There was a matter that came up at the Horse Breeders' meeting, which might be spoken of at this time, and that was the statement that there were too many poor horses being imported into this country, which should not exist, especially considering the valuations we have to put on our horses going into the United States. I refer to a great many cheap bred bronchos coming into this country from the United States, and being distributed all over. These horses come in here, and there is a duty of only $2 or $3 per head paid, while we have to pay a duty of $30 if we send any into the United States. That sort of thing our Government should stop.

Another point is the breeding of what are called war horses. I take issue with some of the gentlemen present in this respect, and my opinion is that the breeding of war horses, or horses fit for war purposes, does not pay the farmer. There will be plenty of misfits to meet all the demands that will arise from that source. There is no need to pro-

duce horses especially for war purposes, because we can find plenty, intended for other purposes,but unsuitable for these purposes, which will serve to meet the demand for horses for military service. I am closely connected with a horse that is much used in the commercial world, that is the draught horse; he is always wanted, and will always command a good price. One reason why horses of all classes do not command even better prices today is because of the expense of collecting. A buyer has to cover too much ground in making his purchases. As a buyer of draught horses I know just how this is. A means of reducing this expense has been found at Orangeville, where once a month they have a horse fair, and buyers go there from all points, and the day I was there eight or ten horses changed hands. By horses being brought together at that point the cost to the buyer of making his selection is reduced, and the farmer, on his part, is brought into direct contact with the man who buys for his own use, and thus the producer secures the full value of the animals he has to sell. I hope that in years to come all other townships and other countries will copy the example of the town mentioned, in order that dealers will know that on a certain day at a certain place they can get a good selection.

Mr. George Pepper agreed with Mr. Hendrie and urged the breeding of fancy horses as there would be enough misfits amongst them for military purposes. Messrs. Crow and Murray and himself had sent exhibits of Canadian horses to all the large shows in the United States, and have won first place right along in the carriage, saddle and hunter classes. What the Government should do is to assist the Canadian dealers in making an exhibition of the same sort of horses in European countries. If the Government would assist in meeting the cost of transportation the dealers would provide a string of horses for exhibition purposes which would win as high a place in Europe as they have already won at the large exhibitions in the United States. He further stated he thought heavy horses should be raised in such counties as York, and others, where the soil is heavy, and light horses raised up in the London district, where the land was light and sandy, as the lime in the lighter soil seemed to give horses finer bone.

Mr. Peter Christie, Manchester : I think the Clydesdale horses are the best horses in the world to breed. Our farmers can produce these high-steppers, but they cannot get a paying price for them when they are produced. This is because they cannot take the time to fit the horse so as to catch the eye of the probable purchaser. There is enough money in such horses, but that money goes to the dealer instead of the farmer. I think the great experience with the ordinary farmer is that he would receive from $60 to $70, while the dealer will possibly get $400 or $500. A horse was bought near me not long ago for $125, but was sold not long afterwards for $500. There was money in this transaction, but it did not go to the farmer—the dealer got it. I think the Clyde is the most profitable horse for the farmer to raise, and if they raise the very best they will get enough culls to give a supply of war horses. Mr. Christie agreeed with the remarks of Mr. Hendrie in respect to bringing in the bronchos. He said there were two sales of these in Almonte, and two sales of the same in his own town of Manchester. The country is being filled up with these cheap horses, which are taking a place that should be filled with our own horses of similar type.

Col. Denison said he believed the farmer should get the profit, and not the dealer get it all. He thought there should be some organization or some system whereby the farmer would reap the benefit and get the profits due him for raising his horses.

Col. Macdonald, of the 48th Highlanders, said : " What has been stated here does not prove that there is no profit for farmers in raising fancy horses to meet the demands of city purchasers. It simply proves that proper facilities have not been provided for bringing the buyer and the producer into direct contact. Mr. Hendrie has shown to you that in one place fairs have been organized at which the producer and purchaser find a common meeting place. A horse fair, such as is held at Orangeville, affords a solution of the difficulty ; it provides the means of bringing the producer into direct contact with the user, and thus enables him to obtain the full value of his produce. We must remember that the market for fancy horses is rapidly increasing. There will be

more people use these horses ten years from now than are using them to-day, and there will be a still greater market twenty years hence. The farmer should secure a fair price for that which he does produce, and the horse fair provides a means to this end." In referring to military horses, Col. Macdonald said: "No matter whether another war follows the conclusion of peace in South Africa or not, there is sure to be a greater demand in the future for horses for military purposes than there has ever been before. The war with the Boers has shown, in a very striking manner, the importance of being able to move troops quickly from place to place. Provision is not made for that by railways, as railways do not provide for flanking movements. The day of cavalry has come to an end, but mounted infantry will take its place in the armies, not only of Great Britain, but in all the great European powers. This will mean a constant and increasing demand, whether there be war or not, for horses of that particular class."

Mr. N. Dyment, of Barrie, also favored the heavy horse idea. He said there was more money in this class of horses for the farmer than in any other. The Northwest was going to furnish an ever-increasing market for animals of this class. What is required there, however, is general purpose rather than the very heavy Clyde. He had raised thoroughbreds himself, but he had done so for the love of the horse. There was no money in thoroughbreds, he said, for himself, and he was sure there was no money in them for the average farmer.

Mr. F. C. Wade, K.C., of the Yukon, in speaking of the introduction of the horses in the north, said he deplored the horrible cruelty which had permitted the slaughter on the trail of three thousand horses in the first year of the Yukon rush. He had personally seen many of them die with the carrion crows picking out their eyes. The first horse inside the passes confronted him suddenly, and, true to his Yorkshire love for horse-flesh, he doffed his hat as if the animal had been the finest lady in the land. The first turkey, a scrubby bird of eight pounds, was raffled for at $5 a throw and realized $300. As to the first cow, she was imported by a saloon-keeper, who invited him and many others to an afternoon milk. They all sat around a table and watched him milk the cow, then they had a glass of milk all round, the first in eighteen months, although their enjoyment of it was marred when they were afterwards billed for it at $2 per glass. These things occurred in 1898, and to-day, in 1902, he declared that the dog teams had been replaced by the finest Clydesdale and Percheron draught horses on the continent.

EIGHTH ANNUAL CANADIAN HORSE SHOW.

Pessimists, like the poor, are always with us, and are to be found among horsemen as well as elsewhere. They were quite in evidence when the question of holding the Eighth Canadian Annual Horse Show was being discussed, giving reasons why the show would not be so successful as in previous years. In the first place there were not the horses in the country; and, in the second place, people would not turn out in large numbers to see a purely horse show.

How ungrounded were these reasons was abundantly evident when the entries closed with a total of 690, or 166 more than in the year previous; and when the unsettled weather failed to deter the crowds which streamed in and filled all the available space in the Armouries on Friday and Saturday evenings so that ticket selling had to be suspended, it was evident that the Horse Show was, if anything, more in favor than ever before.

In order to meet the wishes of breeders, who were desirous of having the Show held earlier in the year than usual, so that it would not interfere with their stallion routes, the dates selected were April 10th, 11th and 12th. Friday, the 11th, was set apart as Farmers' Day, and on that day as many as possible of the breeding classes were judged.

As compared with 1901 there were 90 more entries in the breeding classes and 60 more in the harness and saddle sections. There was a very good display of stallions of all kinds. Thoroughbreds were well up to the average. We were glad to welcome Mr. W. C. Edwards,

M.P., who showed his well-tried and successful sire Sleight of Hand, and won a share of the prize money. Coach stallions were better than usual and included some nice movers. Standard Bred Roadsters were forward in nice quantity in the older class. Hackneys were not numerous, but among them was Mr. R. Beith's new purchase, Alarm, who was shown both on line and in harness, in which he showed to good advantage, as he is one of the best, if not the best, movers in harness on this continent. Shires were exhibited in satisfactory numbers. There is a pleasing improvement in the quality of the animals shown in this class every year. Clydesdales were more numerous than they were in 1901. Sweepstakes honors for Clydesdale stallions went for the first time in the history of the show to a Canadian bred horse. This was Lyon Stewart, exhibited by H. G. Boag, Churchill. There was a good entry of Clydesdale mares over three years old, and a grand lot of teams. For the first time there was a class for single mares or geldings in harness shown to a cart or waggon. This brought out a fine number of entries. Graham Brothers won first honors with their Chicago winner Moss Rose 2nd, who also won in the other classes where she was entered.

The harness classes were all well filled, some of them containing no less than 31 entries, the majority ranging from 20 to 25. The quality, conformation, and action of the horses was never better, and there were very few culls. Saddle horses and hunters too, all showed improvement and were in greater numbers than usual. The increase in the number of pony classes resulted in a good display. For the first time there were classes for Polo ponies. The clever way in which some of these were guided by their riders in and out of the posts excited great applause. The Governor-General again kindly offered a cup for the best four-year-old gelding or mare suitable for cavalry purposes, which was sired by a thoroughbred stallion, while Hon. Sydney Fisher evidenced his interest in the show by giving a second prize of $20 in the same class as he did last year The Roadster class was better filled than ever, and a new class for Pacers brought out no less than 15 entries. Altogether the Show was a brilliant success, and everything went off most satisfactorily.

PRIZE LIST.

The following list gives the prize-winning horses at the Eighth Annual Canadian Horse Show, held April 10, 11 and 12, 1902, with the owners names appended:

BREEDING CLASSES.

Thoroughbreds.

JUDGES: R. R. Pringle, Cobourg; Geo. Torrance, Toronto.

Stallions foaled previous to January 1st, 1899.

1st. Versatile, brown, foaled in 1888. Exhibitor, Wm. Hendrie, Hamilton; sire, Rayon D'Or; dam, Valleria.
2nd. Rothewale, brown, foaled in 1892. Exhibitors, The Telfer Climie Co., Montreal; sire, Moylay; dam, Happy Girl.
3rd. Kapanga, chestnut, aged. Exhibitor, Dr. Andrew Smith, Toronto; sire, Spendthrift (imp.); dam, Kapanga.

Stallions foaled subsequent to and on January 1st, 1899.

1st. Pick Time, brown, foaled in 1899. Exhibitor, E. B. Clancy, Toronto; sire, Pickpocket; dam, Fast time.
2nd. Wire In, chestnut, foaled in 1899. Exhibitor, H. Giddings, Toronto; sire, Wickham; dam, Lady Lightfoot.

Stallions qualified to improve the breed of Saddle Horses and Hunters.

1st. Dracula, chestnut, foaled in 1895. Exhibitors, The Telfer Climie Co., Montreal; sire, Prism; dam, Lavender.
2nd. Sleight of Hand, chestnut, foaled in 1891. Exhibitors, W. C. Edwards & Co., Rockland; sire, Nucas; dam, Necromancy.
3rd. Ballymore, bay, foaled in 1892. Exhibitors, The Telfer Climie Co., Montreal; sire, Hollywood; dam, Highland Girl.

Carriage or Coach Stallions.

Judges: R. Gibson, Delaware; R. Graham, Claremont.

Stallions foaled previous to January 1st, 1899.

1st. Performer, bay, foaled in 1897. Exhibitor, W. N. Scott, Milton; sire, Phenomenon (imp.); dam, by Derby.
2nd. Lord Roberts, bay, foaled in 1898. Exhibitor, J. L. Reid, Derry West; sire, Wiley Buckles; dam, Fuchsia.
3rd. Lord Roberts 1126, bay, foaled in 1898. Exhibitor, A. Hewson, Grahamsville; sire, Shining Light 1178; dam, Mountain Lass (imp.) 53.

Stallions foaled subsequent to and on January 1st, 1899.

1st. General Buller, bay, foaled in 1899. Exhibitor, J. L. Reid, Derry West; sire, Wiley Buckles; dam, Hyacinth (imp.)
2nd. Sir Wilfred, bay, foaled in 1899. Exhibitors, Skinner & Colquhoun, Mitchell; sire, Mark D'Or, 670; dam, Flossie, 276.

Standard Roadster Stallions.

Judge: Geo. McCormack, London.

Stallions foaled previous to January 1st, 1899.

1st. Keswick, 10144, chestnut. Exhibitor, G. W. Curtis, Lindsay; sire, Jay Gould 197; dam, Amette.
2nd, Dashwood, 12486, bay, foaled in 1888. Exhibitor, Jas. Wetherel, Galt; sire, Sentinel Wilkes, 1149; dam, Nutwood Queen.
3rd. Golden Jubilee, 29574, chestnut, foaled in 1895. Exhibitor, T. E. Armstrong, Derry West; sire, Norfolk, 3670; dam, Gipsy Wilkes.

Stallions foaled subsequent to and on January 1st, 1899.

1st. Brian Boru, 34551, bay, foaled in 1900. Exhibitor, A. Kerr, Toronto; sire, Wildbrino, 10063; dam, Jennie Hinman.

Best Standard Bred Stallion, any age. Gold medal given by Toronto Industrial Exhibition Association.

1st. Keswick, 10144. Exhibitor, G. W. Curtis, Lindsay.

Hackneys.

Judges: R. Gibson, Delaware; R. Graham, Claremont.

Stallions foaled previous to January 1st, 1899.

1st. Alarm—134—brown, 4 white legs, foaled May, 1897. Bred by M. Harrison, Chestnut Hill, Pa. Exhibited by R. Beith, Bowmanville; sire, Wildfire (imp.)—135—(1224); dam, Garton Pride (imp.)—156—(2772).
2nd. Dante (imp.)—133—(5578), chestnut, near hind fetlock white, foaled in 1894. Bred by J. W. Marshall, Kirby Grindalythe, Eng. Exhibited by A. B. Campbell, V.S., Berlin; sire, Dagenham (4214); dam, Bugthorpe Lily (3556).
3rd. Rosseau St. George—75—brown, foaled April 23, 1898. Bred by H. N. Crossley, Rosseau. Exhibited by Skinner & Colquhoun, Mitchell; sire, Rosseau Performer (imp.)—34—(5391); dam, Lady Bird (imp.)—15—(5510).

Stallions foaled subsequent to and on January 1st, 1899.

1st. Thorncliffe Performer—104—bay, foaled June 1st, 1900. Bred by Hon. M. H. Cochrane, Hillhurst, Que. Exhibited by Robt. Davies, Toronto; sire, Barthorpe Performer (imp.)—52—(5097); dam, Lady Lynn—118—(2934) 574.
2nd. Guelph Performer—89—brown, off hind foot white, foaled May 27, 1899. Bred by D. & O. Sorby, Guelph. Exhibited by Hastings Bros., Crosshill; sire, Square Shot (imp.)—27—; dam, Miss Baker (imp.)—16—(1371).
3rd. Count of Roseberry—109—chestnut roan, white on nigh hind leg, foaled May 8, 1900. Bred and exhibited by H. N. Crossley, Rosseau; sire, Lord Rosebery (imp.)—9—402—(1307); dam, Althorpe Countess (imp.)—20—(6357).

Mares foaled subsequent to and on January 1st, 1899.

1st. Titania—103—chestnut, off fore and hind feet white, foaled May 10, 1899. Bred and exhibited by R. Beith, Bowmanville; sire, Squire Rickell—74—264; dam, Mona's Queen (imp.)—4—(5887).
2nd. Queen of the Party—133—chestnut roan, off fore foot and hind legs white below joints, foaled April 12, 1900. Bred and exhibited by H. N. Crossley, Rosseau; sire, Rosseau Performer (imp.)—34—(5391); dam, Lady Cocking (imp.)—11—(5530).
3rd. Princess Feodora—151—bay, foaled July 9, 1900. Bred and exhibited by R. Beith, Bowmanville; sire, Squire Rickell—74—264; dam, Florence (imp.)—3—354.

High Stepper, Mare or Gelding not under 15 hands shown to suitable conveyance; to be sired by registered Hackney Stallion.

1st. South Africa, black mare, 6 years old. Exhibitors, Crow & Murray, Toronto; sire, Jubilee Chief (imp.)—1—(2122).
2nd. Derby Sportsman, b. g., 5 years old. Exhibitor, A. Yeager, Simcoe; sire, Courier.
3rd. Hermia—90—b. m., 4 years old. Exhibitor, R. Beith, M.P., Bowmanville; sire, Royal Standard (imp.)—55—(1918).

Sweepstakes—Best Hackney Stallion, foaled in Canada; given by the Canadian Hackney Horse Society.

1st. Thorncliffe Performer—104—. Exhibitor, Robert Davies, Toronto.

Sweepstakes—Best Hackney Mare, foaled in Canada; given by the Canadian Hackney Horse Society.

1st. Hermia—90—. Exhibitor, R. Beith, M.P., Bowmanville.

Sweepstakes—Best Hackney Stallion; given by the Toronto Electoral District Agricultural Society.

1st. Alarm—134—. Exhibitor, R. Beith, M.P., Bowmanville.

Sweepstakes—Best Hackney Mare or Filly, by an imported sire and out of an imported dam, both registered in the English Hackney Stud Book; given by Hackney Horse Society of Great Britain.

1st. Queen of the Party—133—. Exhibitor, H. N. Crossley, Rosseau.

Sweepstakes—Best Hackney Stallion or Entire Colt, by an imported sire, and out of an imported dam, both registered in the English Hackney Stud Book; given by Hackney Horse Society of Great Britain.

1st. Alarm—134—. Exhibitor, R. Beith, M.P., Bowmanville.

Shires.

Judge: Jas. Henderson, Belton.

Stallions, foaled previous to January 1st, 1899.

1st. Blaisdon William (imp.) [302] (16529) bay, four white legs, foaled in 1896. Bred by Peter Stubbs, Blaisdon, Eng. Exhibited by Berry & Yeiger, Hensall; sire, Hitchin Conqueror (4458); dam, Dunnmore Bonney Lees (12196).
2nd. King Charming (imp.)
3rd. Jubilee Victor (imp.) [344] (17422) black, near fore foot and both hind legs white, foaled in 1897. Bred by Lord Rothschild, King Park, Eng. Exhibited by Jos. Vance, New Hamburg; sire, Coeur de Lion 4th (11233); dam, Busy Starlight (9605).

Stallions foaled in 1899.

1st. Newnham Duke (imp.) [343] brown, near hind stocking white, foaled in 1899. Bred by F. W. Dancer, Newnham Grange, Daventry Eng. Exhibited by J. M. Gardhouse, Highfield; sire, Calthorpe Irving (14555); dam, Blossom, (27624).
2nd. Southport (imp.) [347] (20041) brown, hind legs white, foaled in 1899. Bred by P. Rimmer, Ormskirk, Eng. Exhibited by T. J. Berry, Hensall; sire, Blythwood Harold (15492), dam, Nora 2nd, (30765).
3rd. Pelham Boy [284] bay, nigh fore foot white, hind feet white, foaled in 1899. Bred and exhibited by Morris, Stone & Wellington, Fonthill, sire, Pride of Hatfield (imp.) [256] (13103); dam, Beatrice (imp.) [97].

Stallions foaled subsequent to and on January 1st, 1900.

1st. What's Wanted [345] brown, white face, nigh front foot and off hind foot white, foaled April 23, 1901. Bred and exhibited by H. A. Gardhouse, Highfield; sire, Darnley (imp.) [183] (3585); dam, Jean of Highfield [155].

Mare, three years old and over.

1st. Laura [112] bay, near front and both hind legs with white stockings, foaled May 1, 1896. Bred by Morris, Stone & Wellington, Fonthill. Exhibited by Jno. Gardhouse, Highfield; sire, Pride of Hatfield (imp.) [256] (13103); dam, Daisy [82].
2nd. Rose [145] bay, off hind foot white, foaled in 1898. Bred and exhibited by Morris, Stone & Wellington, Fonthill; sire, Pride of Hatfield (imp.) [256] (13103); dam, Queen [65].
3rd. Violet [126] bay, hind fetlock white, foaled in 1897. Bred by Morris, Stone & Wellington, Fonthill. Exhibited by John Gardhouse, Highfield; sire, Pride of Hatfield (imp.) [256] (13104); dam, Elsie Morin (imp.) [34].

Mare, under three years.

1st. Victoria [147] black, nigh hind fetlock white, foaled June, 1899. Bred and exhibited by J. M. Gardhouse, Highfield, sire, Darnley (imp.) [183] (3585); dam, Queen of Highfield [117].

Clydesdales.

Judges: I. H. Kimball, Montreal; James Henderson, Belton.

Stallions foaled previous to Jan. 1st., 1899.

1st. Lyon Stewart [2732], bay, hind feet white, foaled June 7, 1898. Bred by Jno. Stewart, Springbank. Exhibited by H. G. Boag, Churchill; sire, Lanodie Rover (imp.) [2725] (9779); dam, Housten Lassie (imp.) [679].

2nd. Lord Minto [2673], chestnut, white hind feet, foaled May 14, 1898. Bred by J. W. Kennedy, Milliken. Exhibited by R. Canning, Hagerman : sire, Haddo Chief (imp.) [1609] (7798) ; dam, Comely 2nd [853] (3002).
3rd. Sherlock Holmes (imp.) [3242] (10453), brown, hind feet white, foaled May, 1894. Bred by W. Hunter, Garthland Mains, Scot. Exhibited by Crake & Linstead, Queensville, Ont.; sire, Mains of Airies [2865] (10379) ; dam, Darling of Garthland [3124] (8545).

Stallions foaled in 1899.

1st. Strathcona (imp.) [3238], bay, white face, feet and legs white, foaled May 16, 1899. Bred by W. Finlayson, Throsk Mains, Stirling, Scot. Exhibited by J. M. Gardhouse, Highfield ; sire, The Gallant (Vol. 25, S.C.B.) ; dam, Kate of Throsk (13795).
2nd. Bay Chief [2955] 9979, bay, hind feet white, foaled Aug. 20, 1899. Bred by W. Major & Son, Whitevale. Exhibited by Skinner & Colquboun, Mitchell ; sire, Lord Wellington (imp.) [2961] 9977 (6981) ; dam, Jenny (imp.) [2935] 9978.

Stallions foaled subsequent to and on Jan. 1st., 1900.

1st. Lion Boy [3043], bright bay, face and hind legs white, foaled June 28, 1900. Bred by Jas. Rae, St. Paul, Ont. Exhibited by P. H. Petre, Stratford ; sire, Bold Boy (imp.) [1149] (4257) ; dam, Jean Craig [3085].

Canadian bred Clydesdale Stallions foaled previous to Jan. 1st., 1901.

1st. General Bobs [2603], bright bay, four white feet, foaled June 20, 1898. Bred by E. W. Charlton, Duncrief. Exhibited by H. G. Boag, Churchill ; sire, Marquis of Salisbury (imp.) [1909] (5208) ; dam, Lady Wigtown [2680]
2nd. Prince of Kinellar 2nd [3236], bay, hind ankles white, foaled May 10, 1900. Bred by Jas. Innes, Sonya. Exhibited by Innes & Hill, Sonya ; sire, Prince of Kinellar (imp.) [2475] (10614) ; dam, Fan [2511].

Clydesdale mares, imported or Canadian bred, 3 years and over.

1st. Moss Rose 2nd [2791], bay, four white legs, foaled April 18, 1894. Bred by A. B. Ogilvie, Madison, Wis. Exhibited by Graham Bros., Claremont ; sire, Macqueen (imp) [462] 3513 (5200) ; dam, Lady Marian [1651].
2nd. Glen Ida [2597], bay, stripe, three white feet, foaled April 11, 1898. Bred by Alexander Doherty, Ellesmere. Exhibited by breeder ; sire, Macqueen [2218] ; dam, Daisy Bell [2596].
3rd. Gipsy of Guelph [2315], brown, nigh front and off hind feet white, foaled in 1896 Bred by D. & O. Sorby, Guelph. Exhibited by Eastwood Bros., New Toronto ; sire, Grandeur (imp.) [1724] (6814) ; dam, Venus (imp. in dam) [2069].

Clydesdale Mares, imported or Canadian bred, under 3 years.

1st. Royal Queen [2802], bright bay, four white legs, foaled May 23, 1900. Bred and exhibited by Hodgkinson & Tisdale, Beaverton ; sire, Macqueen (imp.) [462] (5200) ; dam, Royal Princess [2345].

Pair of Draught Mares or Geldings, any breed whatever, shown in harness.

1st. Moss Rose 2nd [2791], b. m., King Rose, b. g. Exhibitors, Graham Bros., Claremont.
2nd. Dock, b. g., Jim, b. g. Exhibitor, Geo. Moore, Waterloo.
3rd. Laura [112], b. m,, Violet [126], b. m. Exhibitor, Jno. Gardhouse, Highfield.

Single Draught mare or Gelding, any breed whatever, shown to a cart or wagon.

1st. Moss Rose 2nd [2791]. Exhibitors, Graham Bros., Claremont.
2nd. Laura [112]. Exhibitor, Jno. Gardhouse, Highfield.
3rd. Daisy Belle [2596]. Exhibitor, A. Doherty, Ellesmere.

Best Clydesdale Stallion, any age.

1st Strathcona (imp.) [3238] (11030). Exhibitor, J. M. Gardhouse, Highfield.

Best Clydesdale Mare, any age.

1st. Moss Rose 2nd [2791]. Exhibitors, Graham Bros., Claremont.

HARNESS CLASSES.

JUDGES : R. P. Stericker, East Orange, N.J.; G. B. Hulme, New York ; W. J. Stark, Stouffville.

Mare or Gelding, over 14 hands 1 inch and not exceeding 15 hands. To be shown to a gig, cart or phaeton.

1st. Just In Time, b. g., 14.3½, 6 yrs. Exhibitors, Crow & Murray, Toronto.
2nd. Sparkle, b.m., 14.2½, 6 yrs. Exhibitor, Mrs. A. Beck, London.
3rd. On Time, b. g., 14 3½, 7 yrs. Exhibitors, Crow & Murray, Toronto.

Mare or Gelding over 15 hands and not exceeding 15 hands 2 inches. To be shown to a gig, cart or phaeton.

1st. Derby Sportsman, b. g., 5 yrs. Exhibitor, A. Yeager, Simcoe.
2nd. Applause, b. g., 15.2, 5 yrs. Exhibitors, Crow & Murray, Toronto.
3rd. Robbie Burns, b. g., 15.2, 7 yrs. Exhibitor, T. S. Smith, Montreal.

Mare or Gelding exceeding 15 hands 2 inches. To be shown to a gig, cart or phaeton.

1st. British Lion, blk. g., 15.3½, 7 yrs. Exhibitors, Crow & Murray, Toronto.
2od. Duke, b. g., 15.3, 6 yrs. Exhibitor, P. Maher, Toronto.
3rd. Derby Woodland, b. g., 5 yrs. Exhibitor, A. Yeager, Simcoe.

Pair of horses, Mares or Geldings, 15 hands 2 inches and under. To be shown to a four wheeled vehicle.

1st. Always Ready, b. g., 15.1, 7 yrs.; Just Ready, b. g., 15.1, 6 yrs. Exhibitor, G. H. Gooderham, Toronto.
2nd. Just In Time, b. g., 14.3½, 6 yrs.; On Time, b. g., 14.3½, 7 yrs. Exhibitors, Crow & Murray, Toronto.
3rd. Applause, b. g., 15.2, 5 yrs.; Encore, b. g., 15.2, 5 yrs. Exhibitors, Crow & Murray, Toronto.

Pair of horses, Mares or Geldings, over 15 hands 2 inches. To be shown to a four wheeled vehicle.

1st. British Lion, blk. g., 15.3½, 7 yrs.; South Africa, blk. m., 15.3, 5 yrs. Exhibitors, Crow & Murray, Toronto.
2nd. Plebiscite, b. g., 15.3½, 4 yrs.; Prohibition, b. g., 16, 5 yrs. Exhibitor, W. A. Lawrence, Milton.
3rd. Perry, br. g., 15.2⅞, 5 yrs.; Galt, br. g., 15.2⅞, 5 yrs. Exhibitor, A. S. Chisholm, Oakville.

Pair of horses not under 15 hands 2 inches. Shown to a Brougham.

1st. Mohawk, b. g., 15.3, 5 yrs.; War Eagle, b. g., 15.3, 5 yrs. Exhibitor, G. Gooderham, sr., Toronto.
2nd. Winnie Honor, blk. ch. m., 15.3, 6 yrs.; Canadian, blk. ch. g., 15.3, 5 yrs. Exhibitor, J. Ross Robertson, Toronto.

Champion Harness Horse.

1st. British Lion, blk. g., 15.3½, 7 yrs. Exhibitors, Crow & Murray, Toronto.

TANDEMS.

Harness Tandems, wheeler to be over 15 hands high.

1st. British Lion, blk. g., 15.3½, 7 yrs.; South Africa, blk. m., 15.3, 5 yrs. Exhibitors, Crow & Murray, Toronto.
2nd. Derby Woodland, b. g., 5 yrs.; Derby Sportsman, b. g., 5 yrs. Exhibitor, A. Yeager, Simcoe.
3rd. Lord Bryson, br. g., 15.3, 5 yrs.; Prince Talleyrand, br. g., 15.3, 4 yrs. Exhibitor, Mrs. F. M. Fraser, Toronto Jct.

FOUR-IN-HANDS.

Teams not under 15 hands, may be shown before a coach, dray or brake.

1st. Exhibitor, G. Pepper, Toronto.
2nd. Exhibitor, W. A. Lawrence, Milton.
3rd. Exhibitor, Major Stimson, Toronto.

SADDLE HORSES.

JUDGES: J. N. Scotchard, Buffalo, N.Y.; Capt. J. G. Miller, Toronto; Major Ormsby Gore, London, Eng.

Best Saddle and Harness Horse, mare or gelding, 15 hands and over, to be first shown in an appropriate vehicle and judged as a horse best suited for harness purposes, the horse to be unharnessed in the ring and to be shown and judged under saddle. The horses best suited for both these purposes to be awarded the prizes.

1st. Falkirk, b. g., 15.3, 6 yrs. Exhibitor, Mrs. A. Beck, London.
2nd. Duchess, roan m., 15.1¾, 6 yrs. Exhibitor, G. Pepper, Toronto.
3rd Denison, ch. g., 16. 5 yrs. Exhibitor, B. H. Millard, Orillia.

Mare or Gelding over 14 hands 2 inches and not exceeding 15 hands 2 inches.

1st. Duchess, roan m., 16.1¾, 6 yrs. Exhibitor, G. Pepper, Toronto.
2nd. Kohinoor, ch. m., 15.3, 4 yrs. Exhibitor, W. H. Smith (agent), Toronto.
3rd. Postboy, ch. g., 15, 5 yrs. Exhibitor, Mrs. A. Beck, London.

Mare or Gelding over 15 hands 2 inches up to carrying 160 lbs.

1st. Winsome, br. m., 15.3, 4 yrs. Exhibitor, G. A. Case, Toronto.
2nd. Victor Hugo, b. g., 16.5 yrs. Exhibitor, G. Pepper, Toronto.
3rd. Falkirk, b. g., 15,3, 6 yrs. Exhibitor, Mrs. A. Beck, London.

Mare or Gelding over 15 hands 2 inches, up to carrying 190 lbs.

1st. Ontario, blk. g., 16.1, 4 yrs. Exhibitor, G. Pepper, Toronto.
2nd. Goldspur, ch. g., 16, 6 yrs. Exhibitor, A. Beck, London.
3rd. Westminster Belle, ch. m., 16.1, 8 yrs. Exhibitor, Mrs. A. Beck, London.

Lady's Saddle Horse not under 14 hands 3 inches, to be ridden by ladies.

1st. Falkirk, b. g., 15.3, 6 yrs. Exhibitor, Mrs. A. Beck, London.
2nd. Duchess, roan m., 15.1¾, 6 yrs. Exhibitor, G. Pepper, Toronto.
3rd. Quiller, b. g., 15.3, 4 yrs. Exhibitor, G. A. Case, Toronto.

Champion Saddle Horse.

1st. Duchess, roan m., 15.1¾, 6 yrs. Exhibitor, G. Pepper, Toronto.

HUNTERS AND JUMPER.

Qualified Hunters, heavyweight, up to carrying 180 lbs. Conformation and quality to count 60 per cent.; performance over fences to count 40 per cent. To carry at least 168 lbs.

1st. Rupert, blk. g., 16.2, 6 yrs. Exhibitor, G. Pepper, Toronto.
2nd. Westminster Belle, ch. m., 16.1, 8 yrs. Exhibitor, Mrs. A. Beck, London.
3rd. Senator, ch. g., 16, 4 yrs. G. Pepper, Toronto.

Qualified Hunters, heavyweight up to carrying 150 lbs. Conformation and quality to count 60 per cent.; performances over fences to count 40 per cent. To carry at least 150 lbs.

1st. My Fellow, ch. g., 16, 7 yrs. Exhibitor, Mrs. A. Beck, London.
2nd. Headlight, b. g., 8 yrs. Exhibitor, J. Kilgour, Toronto.
3rd. Falkirk, b. g., 15.3, 6 yrs. Exhibitor, Mrs. A. Beck, London.

Green Hunters, heavyweight.

1st. Acme, b. g., 16, 5 yrs. Exhibitor, A. Beck, London.
2nd. Florence Denison, b. m., 16.1, 6 yrs. Exhibitor, W. E. Wellington, Toronto.
3rd. Wicklow, gr. g., 16, 5 yrs, Exhibitor, L. Meredith, London.

Green Hunters, lightweight.

1st. Victor Hugo, b. g., 16, 5 yrs. Exhibitor, G. Pepper, Toronto.
2nd. Duchess, roan m., 15.1¾, 6 yrs. Exhibitor, G. Pepper, Toronto.
3rd. Alert, b. m., 15.3, 5 yrs. Exhibitor, A. Beck, London.

Jumping.

1st. Dunkirk, b. g., 15.3, 6 yrs. Exhibitor, A. Beck, London.
2nd. Falkirk, b. g., 15.3, 6 yrs. Exhibitor, Mrs. A. Beck, London.
3rd. Chantrey, br. m., 15.3, 6 yrs. Exhibitor, G. A. Peters, M.D., Toronto.

Best performances over 6 jumps.

1st. Pearl, b. m., 16, aged. Exhibitor, G. Pepper, Toronto.
2nd. Lord Minto, br. g., 16, 5 yrs. Exhibitor, G. Pepper, Toronto.
3rd. Myopia, br. g., 15.3, aged. Exhibitor, G. Pepper, Toronto.

Corinthian Class. Horses to be ridden by members of some recognized Hunt. Conformation and quality to count 25 per cent.; performances over fences, 75 per cent.

1st. Lord Minto, b. g., 16, 5 yrs. Exhibitor, G. Pepper, Toronto.
2nd. Westminster Belle, ch. m., 16.1, 8 yrs. Exhibitor, Mrs. A. Beck, London.
3rd. Pearl, b. m., 16, aged. Exhibitor, G. Pepper, Toronto.

Toronto Hunt Plate, open to horses owned and ridden by members of the Toronto Hunt Club. Performance to consist 50 per cent., conformation and quality 50 per cent.

1st. Vendetta, br. g., 15.2½, 5 yrs. Exhibitor, G. A. Peters, M.D., Toronto.
2nd. Headlight, b. g., 8 yrs. Exhibitor, J. Kilgour, Toronto.

Ladies' Hunters up to carrying 150 lbs. To be ridden by ladies.

1st. Majesty, b. m., 15.2, 7 yrs. Exhibitor, Miss Melvin Jones, Toronto.
2nd. Falkirk, b. g., 15.3, 6 yrs. Exhibitor, Mrs. A. Beck, London.

Champion Hunter.

1st. Pearl, b. m., 16, aged. Exhibitor, G. Pepper, Toronto.

ROADSTERS.

Mare or Gelding, under 15.3.

1st. Bob, ch. g., 15.2¼, 5 yrs. Exhibitor, F. W. Baillie, Toronto.
2nd. Frank, ch. g., 15.2¼, 5 yrs. Exhibitor, F. W. Baillie, Toronto.
3rd. Jennie McLaughlin, b. m., 15.2, 4 yrs. Exhibitor, J. A. Kelly, Listowel.

Mare or Gelding, 15.3 and over.

1st. Nelly Goldleaf, br. m., 15.3, 9 yrs. Exhibitor, M. E. Mitchell, Brampton.
2nd. William N., br. g., 16, 8 yrs. Exhibitor, T. Bartrem, Toronto.
3rd. St. Cloud, roan g., 15.3, 5 yrs. Exhibitor, Crow & Murray, Toronto.

Pair of Roadster Mares or Geldings.

1st. Victor, b. g., 15.2, 4 yrs.; Victoria, b. m., 15.2, 4 yrs. Exhibitor, J. D. McGibbon, Milton.
2nd. Bob, ch. g., 15.2¼, 5 yrs.; Frank, ch. g., 15.2½, 5 yrs. Exhibitor, F. W. Baillie, Toronto.
3rd. May, b. m., 15.2, 8 yrs.; Mabel, b. m., 15.2, 5 yrs. Exhibitor, Miss K. L. Wilkes, Galt.

Champion Roadster.

1st. Nellie Goldleaf, br. m., 15.3, 9 yrs. Exhibitor, M. E. Mitchell, Brampton.

Best Pacer, any age.

1st. Montenegro, blk. g., 8 yrs. Exhibitor, T. M. Lee, Toronto.
2nd. Blackthorn, blk. g., 15.3, 6 yrs. Exhibitor, D. Doan (agent), Toronto.
3rd. Little Fred, br. g., 15.1, 8 yrs. Exhibitor, W. R. Barnes, Toronto.

PONIES.

Pony in harness, 12 hands and under.

1st. Puss, br. m., 11 2⅜, 7 yrs. Exhibitor, G. V. Foster, Toronto.
2nd. Topsy, b. m., 12, 6 yrs. Exhibitor, W. Mackenzie, Toronto.

Pony in harness over 12 and not exceeding 13.1 hands.

1st. Margaret, b. m., 12.3, 6 yrs. Exhibitor, Miss E. Ames, Toronto.
2nd. Lady Isabel, ch. m., 12.2, 6 yrs. Exhibitor, D. & H. Gooderham, Toronto.

Pony in harness over 13 hands 1 inch and not exceeding 14 hands 1 inch.

1st. Flashlight, b. m., 13.3¼, 5 yrs. Exhibitor, P. Maher, Toronto.
2nd. Dorrington 3rd, b. g. Exhibitor, C. A. Burns, Toronto.

Best Pony Stallion, 14 hands and under.

1st, Duke of York, brown, 13, 3 yrs. Exhibitor, Broadview Pony Farm, Toronto.

Ponies, under 14 hands to be ridden by a boy or girl, to be shown at a walk, trot and canter. Manners to count 60 per cent., conformation 40 per cent. Prizes presented by H. N. Crossley.

1st. Lady Grey, gr. m., 13.2, 4 yrs. Exhibitor, Broadview Pony Farm, Toronto.
2nd. Tally Ho, b. g. Exhibitor, R. Davies, jr., Toronto.

Best Pony and Cart, Cup presented by Canadian Pony Society.

1st, Margaret, b. m., 12.3, 6 yrs. Exhibitor, Miss C. Ames, Toronto.

Polo Ponies up to carrying 150 lbs.

1st. Tiny Tim, ch. g. Exhibitor, Major Stinson, Toronto.

Polo Ponies up to carrying 200 lbs.

1st. Satine, roan m., 14.1, 6 yrs. Exhibitor, Col. Lessard, Toronto.

Best Team of 4 Polo Ponies.

1st. Exhibitor, Stanley Barracks Polo Club.

Ponies not exceeding 14.2, up to, not less than, 150 lbs., likely to make good Polo Ponies.

1st. Blaze, ch. mare, 14.2, 4 yrs. Exhibitor, F. A. Campbell, Toronto.

Best and Best appointed pair of Livery Horses, shown to Lamdau.

1st. Exhibitors, Doane Bros., Toronto.
2nd. Exhibitor, P. Maher, Toronto.

Mare or Gelding, shown in Single Harness and Delivery Wagon, as actually used in local deliveries.

1st. Aggie M., gr. m., 16, 6 yrs. Exhibitor, Robt. Simpson Co., Toronto.
2nd. Zulu, b. g., 4 yrs. Exhibitors, S. Price & Sons, Toronto.

Mare or Gelding, shown in Single Harness and Butcher's Cart as used in local deliveries.

1st. Ladysmith, ch. m., 15.2, 7 yrs. Exhibitor, J. W. Holman, Toronto.
2nd. Tommy Atkins, b. g., 15.3, 7 yrs. Exhibitor, Geo. Meech, Toronto.

Best Performance of Professional Private Coachman.

1st. Jas. Morton, coachman for Geo. Gooderham, sr., Toronto.
2nd. A. B. Collett, coachman for Major Stimson, Toronto.
3rd. F. Oakey, coachman for W. A. Grant, Montreal.

Best 4 yrs. old Canadian-bred Gelding or Mare, suitable for riding or cavalry purposes, not less than 15, and not over 15 hands 3 inches, to be sired by a thoroughbred stallion. First prize given by Lord Minto; 2nd by Hon. Sydney Fisher.

1st. Imperial, b. g., 15.3, 4 yrs. Exhibitor, A. G. H. Luxton, Milton.

2nd. Irish Bob, ch. g., 4 yrs. Exhibitor, P. S. Lawrason, Preston.

Pair of Horses to be shown to a T Cart or Phaeton; Dealers excluded. Silver Cup given by Ryrie Bros.

1st. Always Ready, b. g., 15.1, 7 yrs.; Just Ready, b. g., 15.1, 6 yrs. Exhibitor, G. H. Gooderham, Toronto.

Pair of Horses, non-prize winners in harness at any previous show. Given by Mrs. Fraser.

1st. White Socks, blk. m., 15.2, 6 yrs.; Sir Oliver, ch. g., 15.2, 6 yrs. Exhibitor, A. E. Ames, Toronto.

Pair of Horses, suitable for Victoria. Presented by Hutchinson & Son.

1st. Winnie Honor, blk. ch. m., 15.3, 6 yrs; Canadian, blk. ch. g., 15.3, 5 yrs. Exhibitor, J. Ross Robertson, Toronto.

BINDING SECT. AUG 2 4 1967